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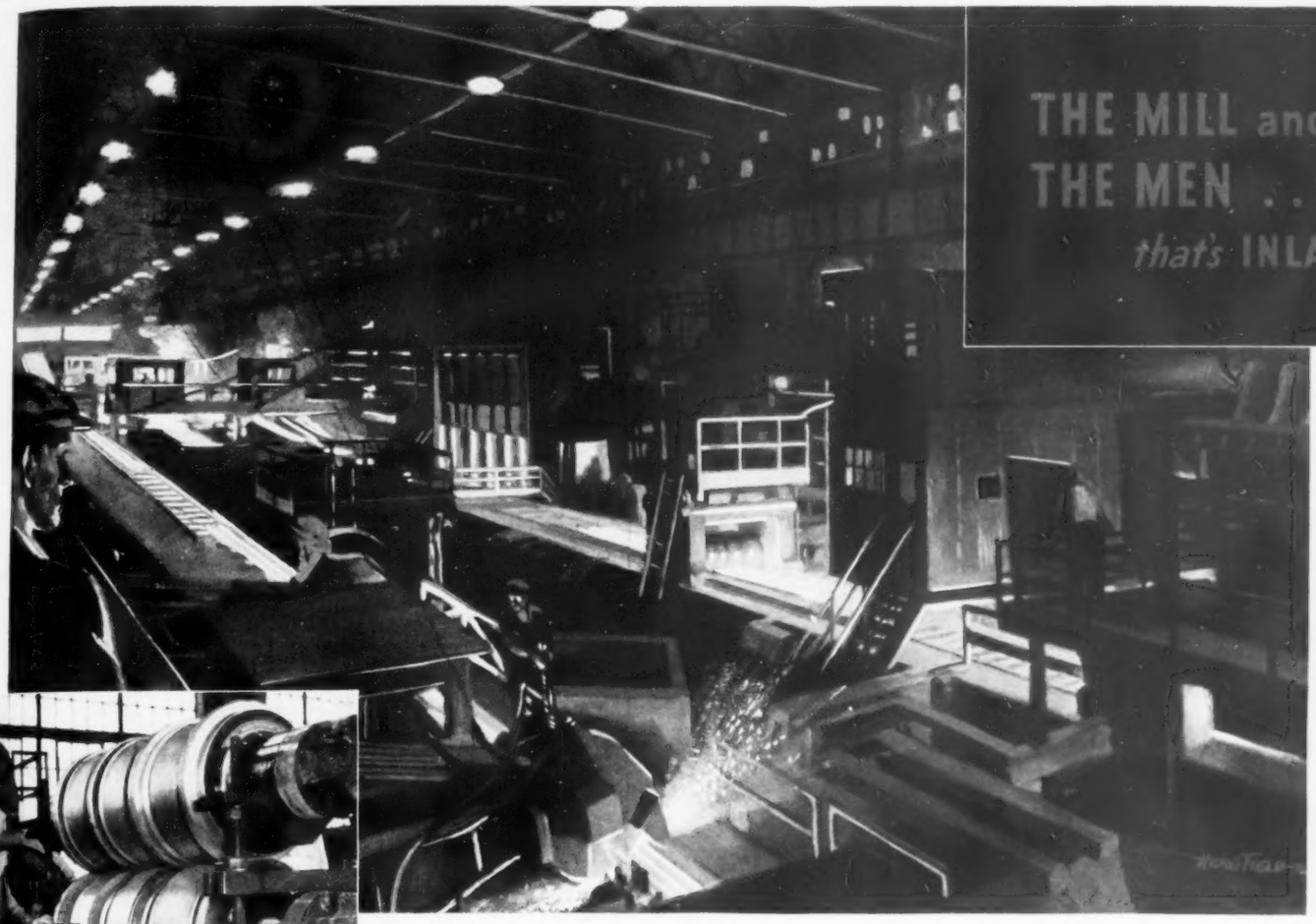
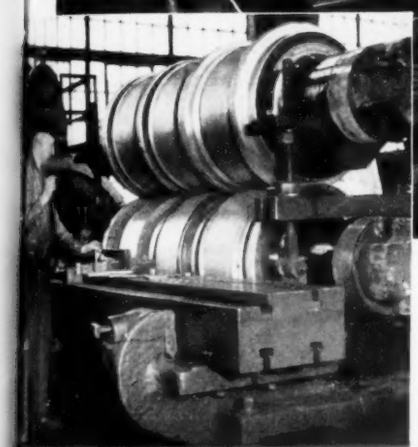
FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW





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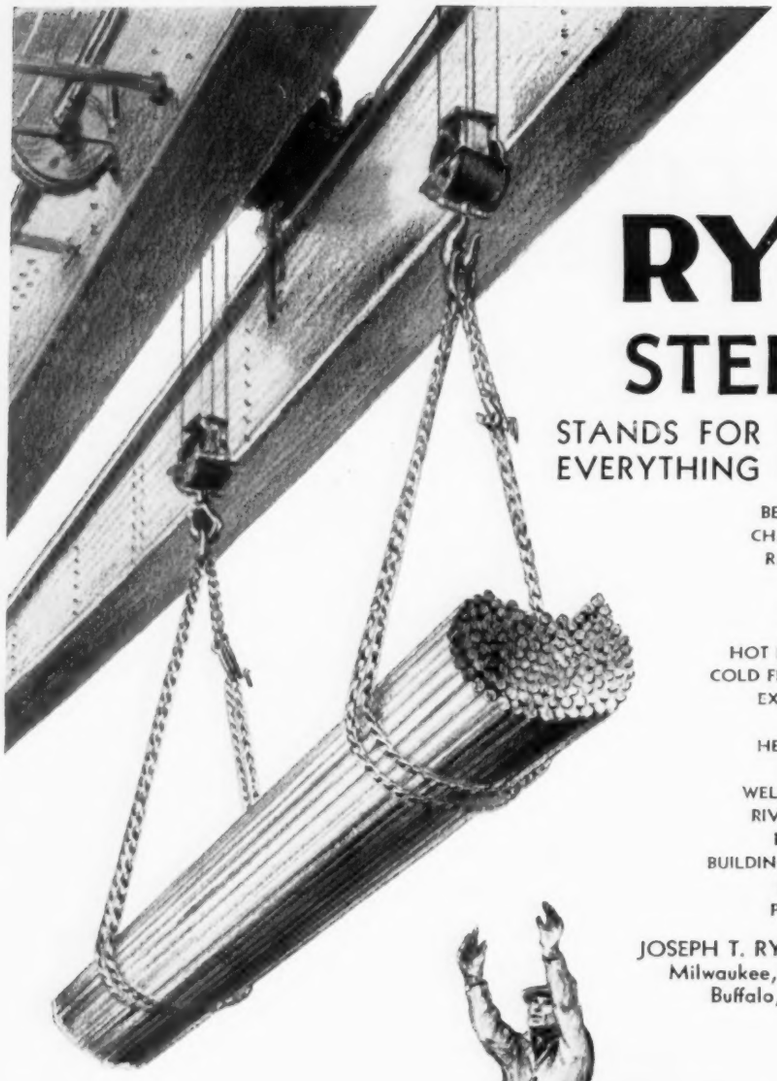

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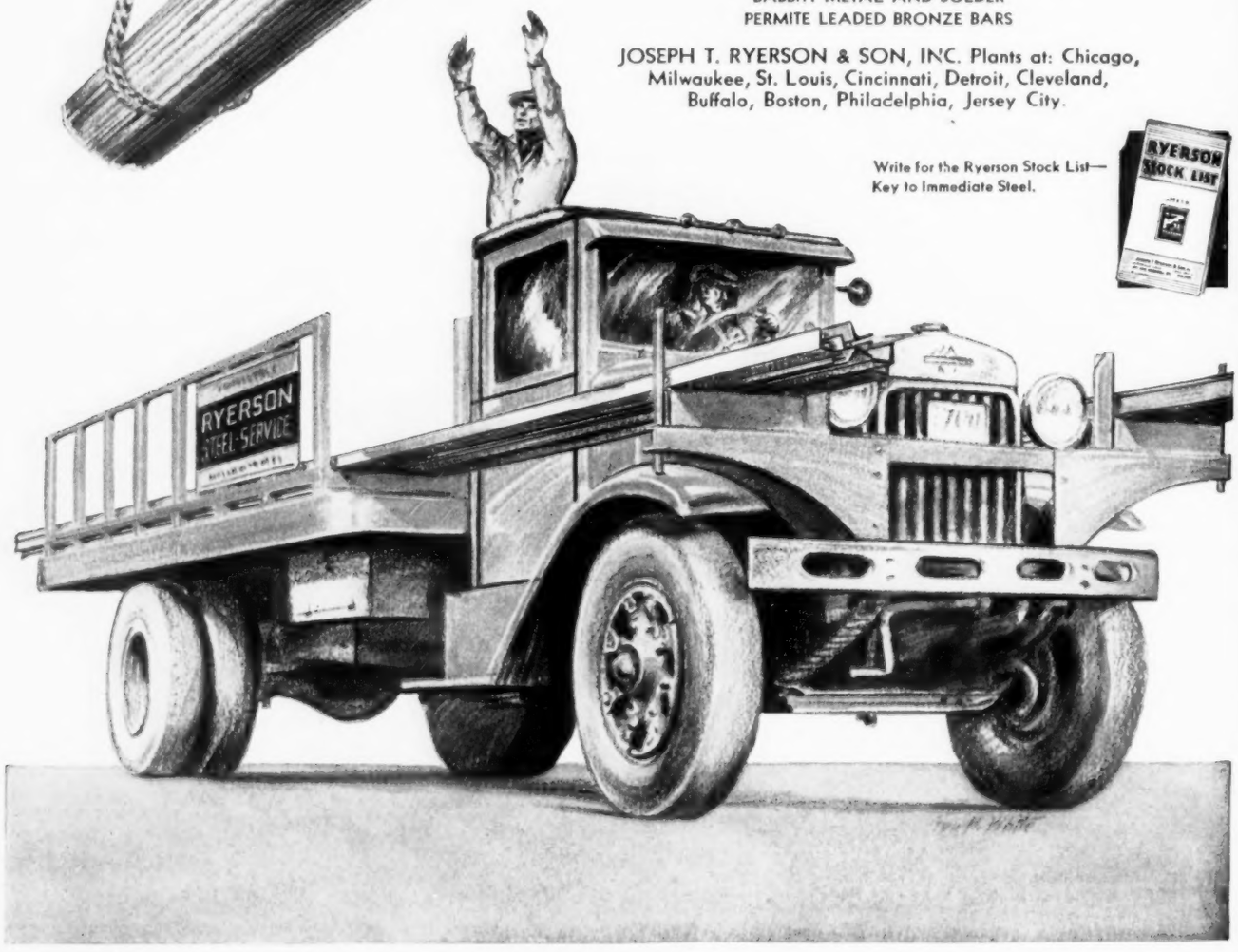


As the Editor Views the News

WHEN Maj. George L. Berry, co-ordinator for industrial co-operation, on Tuesday addressed letters to industrialists, labor union leaders, and executives of former NRA code authorities asking if they will attend a conference to discuss voluntary trade practice agreements (p. 23), he re-opened a host of questions which have lain dormant since the famous Supreme Court decisions of May 27. Suspicious business men will wonder if this is the opening wedge in an attempt to revive the outlawed NRA in another guise. Others will try honestly to determine whether further attempts to co-operate under government sanction will be feasible and advantageous.

• • •

Enforcement Is Not Solution

Industry's experience with pacts negotiated under federal supervision has been disappointing. About a decade ago a score or more groups in the metalworking industries drew up voluntary trade practice codes under the watchful eyes of a sympathetic federal trade commission. The plan fell far short of success. At the time, many executives ascribed the failure to the lack of government police power to enforce the agreements. In 1933, industry again prepared codes, this time with ample machinery for their strict enforcement. Only a few of the hundreds of codes still were working smoothly when NRA was abandoned, the others had become ineffective.

• • •

Problem Lies at Industry's Door

Here are two failures under widely differing circumstances. The first occurred under a government administration which was considered friendly to industry, the second under one which on many counts has exhibited antagonism against industry. One plan failed because it lacked the teeth of enforcement. The other fell down, in all but a few cases, in spite of the fact that the full power of government authority was available for enforcement. In view of this experience, we are encouraged to reiterate a belief expressed editorially in this publication more than 10 years ago, namely, that the ability of an industrial group to govern itself effectively, with or without government assistance, rests primarily upon the individual integrity of the group personnel. For this reason we think the job is up to industry exclusively, and that it is a job of education in ethics.

• • •

Time To Push Steel House

Steelmakers and companies engaged in the fabrication of steel for the frame and accessories of residences are nearer to the point where they can begin to cash in on their pioneering work in this field. Construction of new homes is progressing more actively than in many years. The idea of steel frame construction has taken a firm hold upon the American public. The basic ingredients for a strong upward surge in the building of thousands of steel structured home are existent today. All that remains for makers and fabricators of steel to unlock the door to this attractive market (p. 27) is to perfect the organization required to co-ordinate the functions of material suppliers, architects, contractors, finance agencies, etc. The need for prompt, positive action is urgent.

• • •

New Problems for Steel

Discussion at the later sessions of the National Metal congress, reports of which appear in this issue, gave emphasis to a number of important problems in the making and application of steel to current industrial requirements. The Campbell Memorial lecture, on aluminum additions in modern commercial steels (p. 45), emphasized an important change in the attitude of steelmakers toward the use of this element. The session of the American Welding society in which the welding of the low alloy steels was discussed (p. 49), emphasized the importance of weldability as a quality to be considered intelligently when new alloy steels are developed. . . . Interesting examples of continuous welding of formed strip in the manufacture of mufflers and exhaust pipes are observed (p. 30) at a Racine, Wis., plant.

E. L. Shaner

War Lifts Foreign Ore Prices, Whets Demand For Coke By-Products; Embargo Unchanged

As the Italians penetrated further into Ethiopia last week and the League of Nations acted to isolate Italy as the aggressor, repercussions were felt in markets allied to iron and steel. Inquiry for coke oven by-products, used for explosives, was sufficiently heavy at Pittsburgh to warrant premiums for benzol and indicate a rise shortly in toluol. Italy was the largest buyer, but England, France, and Belgium also were in the market. Many foreign iron ores are ½ to 1 cent a unit higher; manganese is unaffected, but evidently not for long. Finished steel is the subject of many rumors, but apparently no buying yet

European Offers Incite Premiums for By-Products

PITTSBURGH

REPERCUSSIONS of the European war tensity have been felt in the Pittsburgh district. Heavy inquiry is taking place for coke oven by-products which are used in the manufacture of high explosives. These products have not been placed on any contraband list, and are open to American producers for foreign sale.

Most coke by-product sellers, while being flooded by inquiries, are not selling beyond Nov. 1, but on present orders they are obtaining premiums above the market. For example, on transactions last week Pittsburgh sellers obtained better than the going market of 15 cents for benzol. Prospects are quite favorable for an advance in toluol from the 30-cent per gallon price.

Purchases by the foreigners have largely come from Belgium, England, France, and Italy. However, in the case of Italy, the inquiries which are out for toluol and benzol are so large that it is doubtful if any one American by-product works could hope to supply requirements.

Inquire for 8000 Tons

Purchases have been in lots of several thousand tons of these coke oven by-products, and only last week Pittsburgh reported circulation of at least four separate inquiries, each for 2000-ton lots of benzol, all originating from foreign sources.

Pittsburgh steel mills have received practically no inquiry for finished steel products, such as in the form of shrapnel rounds, bars, plates, etc., which might be construed as potential war material. Some rumors have been heard in Pittsburgh a few weeks ago of Italy's buying quantities of billets and shrapnel rounds, but such deals have been unconfirmed and generally discredited.

The Pittsburgh steel producer has felt the effects of the Italo-Ethiopian war in the respect that his steel-making costs—if he uses remelting scrap—have mounted because of Italy's dipping into the Pittsburgh steelmaker's sources of supply on the eastern seaboard. This, however, as detailed in STEEL in many previous issues, has been going on for a number of months and is nothing new.

Alien Ores Advanced; No Buying of Steel

NEW YORK

THE advance in foreign ore prices, recently regarded as likely to be hastened by the Italo-Ethiopian situation, has finally matured, several leading ores having just been boosted ½c to 1c a unit.

A notable exception is manganese ore, but an increase in the c.i.f. figures appear likely soon. Manganese ore producers, it is claimed, have been operating on a none too profitable basis for some time and are likely to boost the present c.i.f. price of 26c per unit on 52 per cent Caucasian and South African ores.

Rise Was Anticipated

This development might later offset the advantage to domestic consumers to be derived from a reduction in tariff as a result of the probable ratification by Brazil in the near future of the reciprocal treaty pending between Brazil and the United States.

The recent increase in ore prices was expected by many in the trade to come before the end of this year in any event, in view of the good demand on the other side for many months and the improving situation in the iron and steel industry in this country. However, hostilities in North Africa are resulting in higher transportation rates and sharply increased ocean insurance rates and, further, are carrying a threat of an ore shortage here later. Interestingly, no Russian iron ore is being offered at this time.

Ores just advanced include foreign manganiferous ore, 45 to 55 per cent iron and 6 to 10 per cent manganese, which is now 10.50c per unit f.a.s. Atlantic ports; North African low phosphorus, 10.50c; Swedish basic, 65 per cent, 9.50c; Swedish low phosphorus, 10.50c; Spanish North African basic, 50 to 60 per cent, 10.50c; and chrome ore, 48 per cent per gross ton, c.i.f. with $19.25 as a minimum.

The situation with regard to finished steel continues little affected by the hostilities in Africa. However, there has been some recent buying of tin plate and steel bars for shipment to Alexandria, apparently for the account of local traders.

No Lack of Bottoms

As noted in a recent issue, there still are a number of empty boats tied up along the eastern seaboard due to disposition of the owners to await higher prices for transportation.

At least that is probably the most important reason; however, another factor is the fear, it is said, that once they got across on the other side they will have difficulty in obtaining return cargoes. Certain owners of these ships appear most willing to move freight for Central and South America, but do not wish to get loaded up with freight for European waters at this time.

Embargo May Involve Exports of Iron, Steel

WASHINGTON

NEITHER iron and steel nor scrap was directly included in the arms embargo invoked by President Roosevelt against Italy and Ethiopia a week ago; nevertheless there still is considerable speculation in Washington at the state department and among interested parties as to what will come next.

The President has absolute power, under the neutrality act, to extend his embargo order if and when he so chooses. While state department officials do not want to hurt the trade of the Untied States, it is known that considerable pressure is being brought to bear from outside sources to broaden the embargo.

The President's order stating that war exists between the two countries carried the same articles on the black list as set forth in a previous order and enumerated on page 8 of STEEL for September 30. The two lists are identical.

An interesting question was

brought to light last week when a steel representative here made an inquiry as to what would be the status of steel in the event that steel later were added to the embargo list.

There seems to be some difference of opinion at the state department regarding this; especially as to whether it would be necessary to obtain a license for every shipment of steel exported if it were destined to other than a belligerent country.

This would depend, it was pointed out in some quarters, on whether steel would be put on the list of "munitions of war" under section two as well as under section one of the neutrality act.

Under section two, it would be necessary to obtain a license for every shipment of "munitions" to non-warring countries with, of course, no shipments at all going to the warring nations.

Under section one, it is impossible to make a shipment to a warring nation but that section requires no licenses to countries not involved.

While officials will not discuss the matter, it is reported that a study is now in progress under the direction of the munitions control board of various commodities including steel, but this is said to be merely a routine matter to prepare for eventualities and has no significance at this time.

The President's course in the near future as regards embargoes may be colored somewhat by what the members of the League of Nations do regarding sanctions.

Should the League, among other things, declare certain commodities embargoed, it is quite possible that the President might follow such a lead.

Embargo Well Considered

The action taken by the President in declaring arms and ammunitions exports to Italy and Ethiopia embargoed was not taken hastily or on the spur of the moment. The matter has been under advisement for many weeks, and had been gone into in all of its phases by the state department.

While no details are available, it is understood that the President had actually signed the proclamation before he left Washington the latter part of last month—to be held for release when and if necessary.

In connection with the presidential proclamation, James H. Moyle, commissioner of customs, has notified collectors of customs throughout the country that the exportation of arms and ammunition are prohibited to the warring countries:

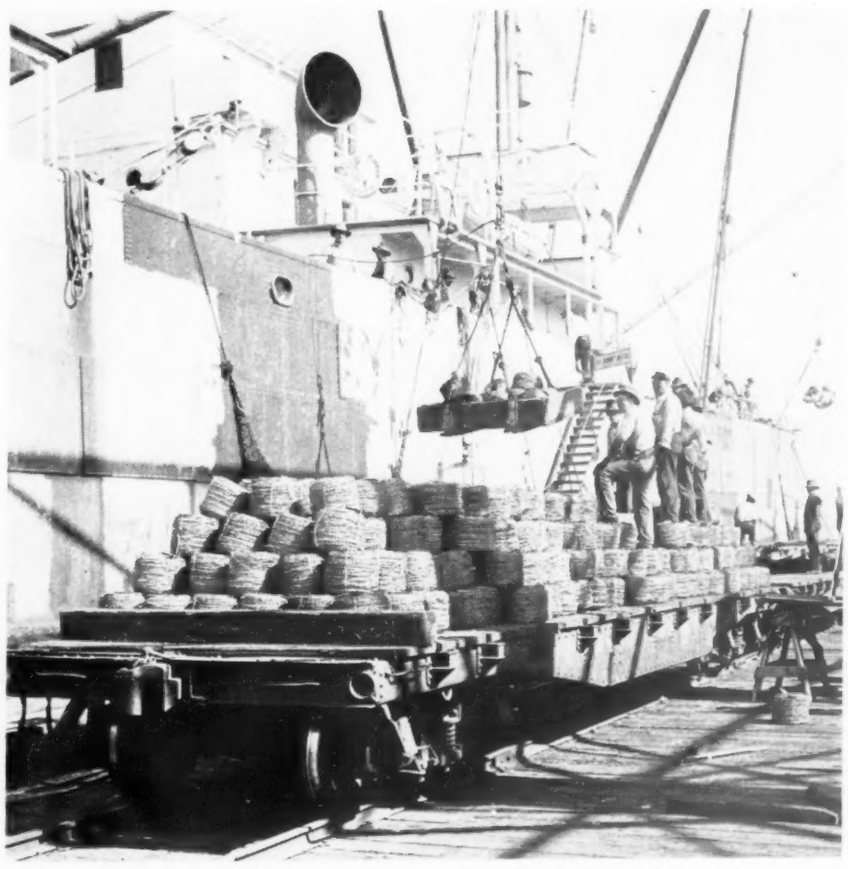
"Shipments from the United States to Ethiopia" the commissioner states, "will most likely move via French Somaliland (Djbouti). Shipments of arms, ammunition, and implements of war to Somaliland shall be detained pending instructions from the bureau (of customs).

"Such shipments shall be reported to the bureau by telegraph, giving the quantities, and kinds of arms, ammunition, and implements of war and names of the manufacturer, consignor, consignee, and vessel.

"Exportations and attempted exportations in violation of the provisions of the joint resolution of congress and the President's proclamation shall be reported promptly to the bureau."

The coast guard has been instructed to co-operate with collectors of customs in this enforcement.

Will It Happen Again?



A familiar sight at a North Atlantic port 20 years ago: Barbed wire being loaded for transport to the trenches on the western front

How War Affected Industry in 1914

WHAT can the steel industry of the United States expect as a result of the war in Ethiopia and developments that may follow in its train?

Looking back to 1914, when hostilities broke out in Europe, some points of similarity are found and other conditions are vastly different. In each case the trouble started from an apparently insignificant incident.

In 1914 it blazed forth suddenly and involved the principal steel-producing nations of Europe, upsetting the balance of trade and making necessary new sources of supply dictated by battle lines.

In the present instance the countries involved are not large steel producers or consumers, and strenuous efforts to prevent spread of hostilities from Africa may avoid a repetition of the earlier experience. No such procedure was possible in 1914.

If the war is confined to the Ethiopian arena, probably little effect will be felt by the steel world. If not, the experiences of 1914 may be repeated, with variations.

When war actually started, Aug. 1, 1914, Germany, France and Belgium, all heavy producers of steel, were immediately involved and Great Britain followed into the maelstrom in a short time. This disrupted established sources of supply and lines of trade, and chaos resulted for a time.

The first effect was felt as early as Aug. 4, when Great Britain, sensing her own need for ferromanganese, put an embargo on exports of that important material for steel manufacture. This was modified later when the situation cleared somewhat,

but supplies were limited for a long time.

The first matter of concern to steelmakers at present is that shipment of manganese ore from Russia, which must pass through the Mediterranean area, may be interrupted should naval operations involve that trade route.

In 1914, almost immediately after military operations started on the Continent, ocean shipping was involved, and it was difficult to charter bottoms for transport of steel exports from the United States.

Apparently, this experience is not to be repeated under present conditions. The first effect of shipping limitations in 1914 was to interrupt exports of steel, particularly of steel rails, of which considerable tonnages were on order in this country.

Scour World For Supplies

By the middle of August, 1914, the price of steel bars was advanced $1 per ton, and shortly after that England began a search for steel supplies to replace those formerly obtained from Germany and Belgium. Semifinished steel was in demand, and lots of 10,000 tons were soon under negotiation.

At the same time, Japan and South America sought steel from producers in the United States to replace supplies no longer available from European sources. Sales were difficult to consummate on account of scarcity of ocean shipping space.

By October, 1914, the warring nations found need for additional machine tool equipment, and inquiries, followed by orders, came from Russia, England, Sweden, and Germany. By November, heavy export orders were booked for barbed wire, and before December arrived contracts for shrapnel shells placed in this country caused heavy demand for machine tools.

On the turn of the year war orders had multiplied, and early in 1915 contracts for machine tools totaling millions of dollars had been placed, for export to Europe. Orders for shrapnel shells also assumed gigantic proportions, one for $15,000,000 being booked, and buying of steel rounds in lots of 10,000 tons was common.

During June, steel mills found themselves booked for full production for three to four months and were reluctant to sell further into the future, holding back on contracts running into fourth quarter. From that point the conditions assumed increasing intensity until 1918.

A point of dissimilarity, then and now, exists in the fact that no real effort to prevent sales of war materials to the belligerents was made in 1914, while such a campaign is now strongly on foot. Its success is difficult to predict and probably depends directly on the extent of world involvement in hostilities.

While in 1914 immediate effects were felt on the steel market, no such premonitory signs are evident now and the industry apparently has no expectation of a repetition of 1914 conditions. Perhaps this is an augury of good, that the war will be circumscribed and will not spread into a world struggle.

Farm Implement Trade 55% over 1934; W. C. MacFarlane Now Heads Institute

FARM implement business this year will be about 75 per cent of the 1928-1930 average, or a gain of 55 per cent over 1934. Compared with 1932, the worst year of the depression, an increase of nearly 170 per cent will be shown.

This information and an optimistic forecast of the 1936 outlook were presented before about 200 farm implement manufacturers and dealers attending the forty-second annual convention of the Farm Equipment Institute at the Blackstone hotel, Chicago, Oct. 9-10.

At the closing session, W. C. MacFarlane, president, Minneapolis-Moline Power Implement Co., Minneapolis, and executive chairman of the Institute the past year, was elected president, succeeding W. King White, president, Cleveland Tractor Co.

C. R. Messinger, Oliver Farm Equipment Co., Chicago, was chosen executive chairman, while F. H. Clausen, president, Van Brunt Mfg. Co., and vice president, Deere & Co., Moline, Ill., was named first vice president. Robert A. Jones was re-elected secretary.

In addition, H. T. Leisenheimer, Cleveland Tractor Co., Cleveland, was elected a vice president, while H. S. Lord, Hart-Carter Co., Peoria, Ill., and C. B. Schmidt, De Laval Separator Co., Chicago, were placed on the executive committee. J. A. Craig, former president, Janesville Machine Co., and F. G. Allen, former president Moline Plow Co., were made honorary members.

A large share of the pickup in equipment sales this year has been due to heavy demand for tractors, harvesting and haying machines, and has been accomplished in the face of several adverse factors.

Mr. MacFarlane pointed out that dust storms and wheat rust restricted sales in certain sections, while export trade has been slow to register increase.

Foreign markets, retarded by unsatisfactory economic conditions abroad and by unfavorable exchage rates, have been only 32 per cent as active as in 1928-1930, compared with the 75 per cent rate in total sales.

Good soil conditions and a favorabl crop outlook support predictions of further gains in implement demand next year, according to Mr. MacFarlane. Higher prices for implements also are likely to develop before long as a result of increased labor and material costs, he stated. Average prices of implements as of June, 1935, were 5.5 per cent less than a year ago, due to reductions in those units which have been in most active demand.

Commenting on activities of the Institute with respect to its recent code and in connection with various federal legislation, Mr. Clausen recommended that the farm implement industry continue to maintain reasonable wages, avoid excessive weekly hours of employment, and observe trade practices fair to competitors and customers.

Implements Whittle Costs

Too much stress cannot be laid upon the importance of lower costs of production in agriculture since it has an influence on business conditions in general, it was pointed out by Harry G. Davis, director of research of the Institute.

Had production costs been reduced to a point that approaches the costs of the more efficient farmers in 1930, deflation of farm prices, which started in that year, would not have had such a serious effect on agriculture and general business, he stated.

Through lower costs the farmer provides insurance against declining prices and increases his profits when prices are above production costs. The farm implement industry plays a vital part in bringing farming costs to an irreducible minimum, he declared, adding that the problem today is not so much the development of more efficient equipment as the obtaining of more universal adoption of existing types of implements.

Improvements in farm machines, as compiled in a report made public last year, were summarized by P. H. Noland, vice president, B. F. Avery & Sons Co., Louisville. The basis of this report was a study at three universities of 25 modern machines, compared with similar units made 20 years ago. These were observed on the basis of design, construction, and materials. Current models were rated from 30 to 115 per cent better than the pre-war units, while during the 20 years a decrease of 15 per cent in selling prices was effected.

Britain in Strong Recovery; Against War, Says Dalton

GOOD, plain common sense, hard work and thrift—these, and no new theories of government or magical formulae—have led to a great business recovery in Great Britain.

Conservative opinion in Britain predominates. The lessons of the World war have not been forgotten by the older generation, and this opinion is exerting itself to the utmost to prevent another European conflagration. But, anyone's guess is as good as another's as to what will grow out of the Italo-Ethiopian war—because no one knows.

These were some of the observations made by Henry G. Dalton on returning from a three-week trip through Great Britain, in an interview last week with STEEL. Mr. Dalton is senior partner in Pickands, Mather & Co., Cleveland, and chairman of the Youngstown Sheet & Tube Co.

War? He talked about it reluctantly. Industry? He was enthusiastic over the way Britain has "come back."

"The country looks alive," he said. "There is nothing like it just now in America." He has visited it on several occasions, the last time previously in 1927 or 1928.

"Industries are thriving, factories and homes are going up every where. The picture conjured up on our trip from Land's End to Scotland was one of amazing activity."

Back to 1929 Levels

Mr. Dalton commented on Britain's increase in steel production, which in 1934 was 9,000,000 tons, nearly double that of 1931, in the pit of its depression, and within 600,000 tons of its 1929 peak.

This year will bring that production back practically to the 1929 level, as it has been making steel so far at the rate of about 9,500,000 tons. Its exports lately have been showing a rapid rise, but that it is using more of its steel for its own reconstruction purposes is manifest in the fact its exports of 2,250,000 tons last year were only moderately above 1,887,000 in 1932.

"What is all this recovery due to?" he was asked.

"I asked that same question of many people," he said, "and from their replies it is my opinion they have simply recognized that thrift and hard work are the best antidotes for any depression. They are managing their affairs well.

"We, too, will show the same relative degree of recovery when we are through with out great expenditures and reform. It is merely a question of exercising good, common sense.

"It seems to be the opinion over there that England's tariff is helping. The new protective tariff regulations are working out satisfactorily.

"I understand this is due to Great Britain's recent tariff adjustments, which, it will be recalled, raised the tariff on steel to 33 1/3 per cent after an agreement was negotiated with the European steel entente limiting imports from the Continent.

Henry G. Dalton

"Conservative opinion predominates in Great Britain. . . It is doing everything it can to keep out of the war."

"Great Britain, I believe, now is practically self-sustaining in steel production, and is making provisions for producing more semifinished steel, which it heretofore has largely imported.

"A new and modern steel plant now coming into operation, and that is causing much interest, is the plant of Stewart & Lloyds Ltd., at Corby. H. A. Brassert, the American engineer, constructed it and now manages its operation. Except for remodeling a couple of blast furnaces, it is all new from the ground up.

"They are using iron ore that is right there at the plant. While it is low grade, they have a large deposit which had not heretofore been considered of value until Mr. Brassert demonstrated what could be done with it. Now they have an open-pit stripping proposition, with ore which can be produced very cheaply and is self-fluxing.

"Another matter of interest to me was the numerous American-owned factories, some of them just recently built. On one of the bypass roads out of London we saw handsome structures put up by Firestone, Hudson, Packard, Gillette and others.

"These bypass roads are being developed extensively in England. They go around cities and villages, and many industrial buildings and homes are going up alongside of them. They aid transportation, especially truck transportation. Slums are being cleared away.

"England always was a great industrial country, and it is becoming more so."

"The charm of old England?" he repeated after a question. "Well, you would have to look around quite a bit out from London before you found that old charm today."

Fear Spread of War

Regarding the war, he said:

"The British public are taking the possibilities of war very seriously, and so are the financial and political leaders. They do not seem concerned so much about the effects of the Italo-Ethiopian struggle, if it can be kept in Ethiopia, but there is a great fear of what may grow out of collateral issues. The prospect of other nations being dragged in, one after another, always is before them.

"Conservative opinion, however, predominates in Great Britain, and I believe it is doing everything possible to avoid a conflict. I am told the same feeling of apprehension is everywhere in Europe. It is almost unbelievable that those countries now on the highway to prosperity should let war destroy it all.

"This much at least may be said: In England the spirit of the people is not set for another war. If war can be averted, England no doubt will enjoy a period of extraordinary industrial growth and prosperity. I was told by those who should know that the same will-to-work and thrift predominate in Germany.

"In England, not one great industry, like automobiles in America, stands out as an accelerator. Of course, she has her own automobile industry, which is forging ahead. Her own building projects are absorbing considerable of the steel she makes, and shipbuilding is enjoying a fair degree of activity."

Mr. Dalton remarked that he believed "the jubilee knitted the Empire to King George closer than ever before. They have great admiration for him. He is a really great man."

Production

STEELMAKING dipped 1½ points last week to 52 per cent, due principally to declines at Chicago, Cleveland, and Detroit. All other districts held steady, with the exception of a small increase in New England. Although automotive releases are a little slower in coming out than was at first anticipated, heavier specifications for machine tools and semifinished continue to be a bright spot in the market. Further details follow:

Youngstown—Remained at 56 per cent last week, and tentative schedules for this week indicate this rate will hold.

Chicago—Dropped 2 points to 58 per cent. The decrease is not regarded as significant, however, since relatively steady operations are looked for the rest of October. Fourteen of the district's 36 steelworks blast furnaces continue active, with heavier production of merchant iron in the near future regarded likely. At least one more merchant furnace will be lighted in this district shortly, while the Zenith stack at Duluth of the Interlake Iron Corp. is being relined in preparation for subsequent operation.

Wheeling—Steady at 81 per cent. Thirty out of 37 open-hearth furnaces are active.

Pittsburgh—Steady at 48 per cent last week. The leading interest closed the week with schedules at 40-45 per cent, the leading independent at 55. No early decline from the present 48 per cent rate is in sight, as mills' backlogs for October shipment are improving.

Twenty-five out of 60 steelworks blast furnaces are now on, and two more may be added shortly when Carnegie blows in one Clairton stack and a fifth furnace at Edgar Thomson.

Cleveland-Lorain—Down 3 points to 59 per cent, National Tube Co., Lorain, taking off two open hearths to operate ten; Otis Steel Co. adding one to make seven, and Corrigan-McKinney division of Republic Steel Corp. continuing with six. At Lorain the bessemer converter was started, operating double turn three days, and single turn three days.

New England—Two points higher to 68 per cent last week, and all producers are planning to hold to their operating schedules this week.

Central eastern seaboard—Unchanged at 37 per cent, although indications still point to a further advance before the end of this month. Finished steel demand is showing further gain, although largely miscellaneous in character.

Buffalo—Held at 52 per cent last week, with 20 open hearths continuing in production. This rate will probably hold throughout the month.

Birmingham—Unchanged at 55½ per cent last week, with twelve open hearths continuing active. Rail rolling for a few days beginning this week will not require the addition of open hearths, the steel to be furnished from Fairfield. The coal strike has not interfered with steel mill operations as yet.

Detroit—Off 8 points to 88 per cent last week, one producer taking off an open hearth to operate seven out of eight, while another continues with eight out of nine.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Oct. 12	Change	Same week 1934	Same week 1933
Pittsburgh	48	None	18	40
Chicago	58	— 2	26	49
Eastern Pa.	37	None	17½	26½
Youngstown	56	None	29½	57
Wheeling	81	None	33	45
Cleveland	59	— 3	28	46
Buffalo	52	None	24	29
Birmingham	55½	None	25	30
New England	68	+ 2	40	95
Detroit	88	— 6	59	55
Average	52	— 1½	25	40

CANADIAN PIG IRON OUTPUT UP IN AUGUST; STEEL FALLS

Pig iron production in Canada for August totalled 54,414 tons, an increase over the July total of 50,513 tons, and the August, 1934, output of 41,485 tons.

Production of ferroalloys dropped from 7269 tons in July to 3893 tons in August. Output for August, 1934, amounted to 2458 tons.

A decline was also registered in steel ingots and castings, August production totalling 82,488 tons, compared with 86,101 tons in July, and 63,504 tons in August, 1934.

For the eight months ending with August, pig iron production totalled 364,704 tons, compared with 236,071 tons for the corresponding months of last year. Output of ferroalloys amounted to 33,354 tons as against 17,077 tons, while production of steel ingots and direct steel castings increased from 527,673 tons to 556,752 tons.

At the end of August four blast furnaces were active in Canda.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)
(Tons)

	1935	1934	1933	1932
Jan.	534,055	331,777	285,138	426,271
Feb.	583,137	385,500	275,929	413,001
March	668,056	588,209	256,793	388,579
April	591,728	643,009	335,321	395,091
May	598,915	745,063	455,302	338,202
June	578,108	985,337	603,937	324,746
July	547,794	369,938	701,322	272,448
Aug.	624,497	378,023	668,155	291,688
Sept.	614,933	370,306	575,161	316,019
9 Mo.	5,341,223	4,797,162	4,157,058	3,166,045
Oct.		343,962	572,897	310,007
Nov.		366,119	430,358	275,594
Dec.		418,630	600,639	227,576
Yrl. adj.		19,907	44,283	5,160
Total		5,905,966	5,805,235	3,974,062

DAILY RATE OF STEEL CORP. SHIPMENTS SHOWS INCREASE

Although shipments of finished steel by the United States Steel Corp. in September totaled 614,933 tons, a loss of 9564 tons from the 624,497 tons shipped in August the rate of shipment per day in September was 1467 tons greater than in August. The apparent loss was due to September having two less operating days. Shipments for nine months of 1935 totaled 5,341,223 tons, a gain of 544,061 tons over the 4,797,162 tons shipped in the same period of 1934.

Republic Adds 4 Directors; Extends Truscon Time

Four new directors were added to the board, two officers were elected, and the time limit for exchange of Truscon Steel Co. stock for stock of Republic Steel Corp., was extended, at a meeting of directors of Republic Friday.

The new directors are: Oscar L. Cox, liquidator of the Union Trust Co.; Donald B. Gillies, former president of Corrigan-McKinney, now merged with Republic; Harvey H. Brown Jr., of Harvey H. Brown & Co.; and H. K. Bourne, vice president of Oglebay-Norton & Co. All are of Cleveland.

Mr. Gillies was elected vice president, and Edward G. Resch, formerly secretary and treasurer of Corrigan-McKinney, was elected assistant treasurer of Republic.

In the letter sent by Republic to Truscon stockholders several weeks ago, offering to exchange Republic stock for Truscon stock, Oct. 10 was set as the expiration date of the offer. At the directors' meeting this date was advanced to Oct. 21.

Housing

FORTY-SIX tons of steel will be used in the Hertstone residence, Ottawa Hills, Toledo, O., to be fabricated by the Art Iron & Wire Works, Toledo, the contract having been awarded through Myron T. Hill, architect. This is an exceptionally large amount of steel for a residence, and the plans include some unusual features which will be described in a subsequent issue of STEEL.

Labor

IRON and steel will figure twice in the forthcoming convention of the American Federation of Labor in Atlantic City, N. J.

One concerns the fight of the vertical or industrial type of unionization against the old craft type of union. John L. Lewis, head of the United Mine Workers, is the outstanding advocate of the vertical type.

The Amalgamated Association of Iron, Steel and Tin Workers, the chief Federation organization in the iron and steel industry, is more a vertical than a craft type. Proponents of this type of organization contend it is the only means by which the Federation can "crack" steel and other large industries.

The second issue for steel is whether the Federation will stand behind its long-planned drive to organize steel.

Louis Leonard secretary of the Amalgamated, is representing that organization at Atlantic City in the absence of Michael F. Tighe, president, who is recuperating from several operations.

LABOR FORCE EQUALS 1929

Dominion Steel & Coal Corp., Sydney, N. S., is now employing 3100 men, the largest number since 1929. This staff will be maintained until the close of navigation.

UNEMPLOYMENT EASES OFF

Unemployed workers in August totaled 9,901,000, compared with 10,121,000 in July and 10,223,000 in August, 1934, states the National Industrial Conference board, New York.

Transportation

BURLINGTON railroad last Tuesday formally took possession of the Mark Twain, a four-car, lightweight, diesel-powered stainless steel train constructed by the Edward G. Budd Mfg. Co., Philadelphia. It replaces two steam trains between St. Louis and Burlington, Iowa. In appearance and structure the new train is almost an exact duplicate of the original Burlington Zephyr, seats 92 passengers, and is capable of speeds over 100 miles per hour. The train was constructed by the Budd shotweld process.

Financial

EDWARD G. BUDD MFG. CO., Philadelphia, has consummated a loan of $5,000,000 for working capital from Philadelphia banks in participation with the Federal Reserve Bank of Philadelphia. The loan was approved in July, but delayed until Oct. 8 due to the necessity for obtaining approval of holders of 6 per cent debentures.

DIVIDENDS ARE DEFERRED

Following a meeting of directors of the Youngstown Sheet & Tube Co., Youngstown, O., Oct. 4, H. G. Dalton, chairman, said it was the opinion of the board that resumption of preferred dividends on any plan would not be in the best interests of the company at this time. Recently there was some agitation in favor of immediate resumption.

DIVIDENDS DECLARED

Parker Rust-Proof Co., Detroit, extra of $1 in addition to quarterly of 75 cents, Nov. 20 to record of Nov. 11.

Stewart-Warner Corp., Chicago, extra of 25 cents in addition to semi-annual of 25 cents, Dec. 2 to record of Nov. 1.

Eaton Mfg. Co., Cleveland, extra of 12½ cents in addition to regular of 25 cents.

Continental Can Co., New York, quarterly of 75 cents, an increase of 15 cents, Nov. 15 to record of Oct. 25.

Steel Corp. Denies Rumors

Engineers of the United States Steel Corp., New York, recently inspected iron ore properties of the Warren Pipe & Foundry Co., Wharton, N. J., but no action will be taken, it was stated at Cleveland headquarters Thursday. Rumors of erection of a Corporation plant at tidewater thus appear unfounded.

September Ingots Best in 7 Months

PRODUCTION of steel ingots during September was at the rate of 113,193 gross tons per day, compared with 108,123 gross tons per day in August, the highest daily average since the high point of the year in February, and, except for February, the highest since June, 1934, according to the compilation of the American Iron and Steel institute.

This is a gain of 5070 tons per day. The percentage of capacity engaged in September was 51.13, compared with 48.84 in August, also the highest rate for the year, except for February.

Total output in September was 2,829,835 gross tons, compared with 2,919,326 tons in August, a decline of 89,491 tons, accounted for by two less working days in September.

For nine months of 1935 the average daily rate of production was 103,193 gross tons, compared with 88,165 tons for the comparable period of 1934. Total production for nine months of 1935 is 24,044,076 gross tons, which is 3,501,742 tons greater than the 20,542,334 tons turned out in the same period of 1934.

It is interesting to note that nine months production in 1935 is only 1,555,042 tons less than for the entire 12 months of 1934. At the present rate of production, this difference will have been made up by the date of this publication, leaving the output for the remaining two and one-half months as net gain over 1934.

Monthly Production—Complete for Bessemer: Open Hearth, Calculated from Reports of Companies Making 97.91 per cent

	Open Hearth		Bessemer		Total		Calculated daily production, all companies (gross tons)	Number of working days
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1935								
Jan.	2,631,673	49.73	239,858	34.99	2,871,531	48.04	106,353	27
Feb.	2,553,429	54.28	224,336	36.82	2,777,765	52.28	115,740	24
Mar.	2,637,331	51.75	230,810	34.97	2,868,141	49.83	110,313	26
Apr.	2,408,588	47.27	231,916	35.14	2,640,504	45.87	101,558	26
May	2,381,061	44.99	254,796	37.17	2,635,857	44.10	97,624	27
June	2,020,406	41.23	210,487	33.17	2,230,893	40.31	89,236	25
July	2,045,768	40.15	224,456	34.01	2,270,224	39.44	87,316	26
Aug.	2,685,965	50.76	233,361	34.05	2,919,326	48.84	108,123	27
Sept.	2,596,098	52.98	233,737	36.83	2,829,835	51.13	113,193	25
9 mo.	21,960,319	48.09	2,083,757	35.23	24,044,076	46.61	103,193	233
1934								
Jan.	1,824,640	34.69	172,489	25.17	1,997,129	33.59	73,968	27
Feb.	2,036,071	43.55	175,873	28.87	2,211,944	41.86	92,164	24
Mar.	2,594,536	49.33	203,904	29.75	2,798,440	47.07	103,646	27
Apr.	2,678,582	55.00	257,482	40.57	2,936,064	53.34	117,443	25
May	3,067,874	58.33	331,620	48.38	3,399,494	57.18	125,907	27
June	2,776,891	54.83	282,592	42.81	3,059,483	53.44	117,672	26
July	1,369,584	28.12	119,869	18.89	1,489,453	27.06	59,578	25
Aug.	1,271,752	24.18	109,598	15.99	1,381,350	23.24	51,161	27
Sept.	1,151,362	23.64	117,615	18.53	1,268,977	23.05	50,759	25
9 mo.	18,771,292	41.36	1,771,042	29.94	20,542,334	40.04	88,165	233
Oct.	1,354,113	25.75	127,789	18.64	1,481,902	24.93	54,885	27
Nov.	1,478,566	29.19	132,059	20.01	1,610,625	28.13	61,947	26
Dec.	1,832,790	37.63	131,467	20.72	1,964,257	35.68	78,570	25
Total	23,436,761	38.68	2,162,357	27.39	25,599,118	37.38	82,312	311

Capacity percentages for 1935 are based upon open-hearth capacity of 60,954,717 tons and bessemer of 7,895,000 tons on Dec. 31, 1934; for 1934 based on open-hearth capacity of 60,583,813 tons and bessemer of 7,895,000 tons on Dec. 31, 1933

Activities of Steel Users and Makers

TUBULAR SERVICE CORP., Bush Terminal, Brooklyn, N. Y., with offices and stocks of steel tubing and boiler tubes at Philadelphia, Pittsburgh, New York, and Boston, has moved its Boston office and warehouse from 23-25 Purchase street to 69-71 Hampshire street, Cambridge, Mass. The corporation will distribute for the Pittsburgh Steel Co., Wheeling Steel Corp., Steel & Tubes Inc., Babcock & Wilcox Tube Co., and Boiler Tube Co. of America. Edward J. Weir, former Philadelphia manager, has been appointed district manager in the New England territory, and Joseph F. Freeman has been named new district manager at Philadelphia.

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Colorado Fuel & Iron Co., Denver, is preparing its pipe plant at Pueblo, Colo., with the expectation of receiving increased business in connection with PWA projects in various parts of the West.

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Thomas S. Gassner Co. Inc., Wayne avenue and Apsley street, Philadelphia, alloy metal fabricators for industrial purposes, has added a new department for complete engineering service, in charge of Charles H. Raub, a registered engineer with experience in this line. It will provide service in manufacturing and erecting blower and exhaust equipment, including ventilating, drying, dust suppression and stock conveying.

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Miller Steel Co. Inc., Newark, N. J., has been appointed warehouse distributor of mechanical seamless steel tubing for the Globe Steel Tubes Co., Milwaukee.

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Timken Steel & Tube Co., Canton, O., is opening a new office at 16 West Sixtieth street, New York, to better serve the metropolitan area trade in seamless tubing and alloy steel of all types. Arthur R. Adelberg has been appointed district manager of sales in charge of the new office.

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Cremer-Case Co., engineer and chemist, has changed its business location from 2800 Washington avenue, N. W., to the National Terminals building, 1200 West Ninth street, Cleveland. The previous location was acquired for a federal housing relief program.

Name Building for Republic

REPUBLIC STEEL CORP. is having a large office building in Cleveland named after it as a result of leasing the thirteenth, fourteenth, fifteenth and sixteenth floors for the consolidation of its general offices, now divided between Cleveland and Youngstown, O.

This building, heretofore known as the Medical Arts building, is a part of the Terminal group in Cleveland. About 350 Republic employes will be transferred from Youngstown to Cleveland Jan. 1, when the new offices are occupied.

Receiving Armco's DSM

Albert Creekbaum (right), crane follower in the Middletown, O., plant of the American Rolling Mill Co., being presented with an Armco Distinguished Service Medal by Charles R. Hook, president of the company. Mr. Creekbaum was honored for "quick thinking and acting in an emergency to save human lives." He stopped a runaway crane whose operator had fainted, saving the operator from injury as well as three fellow workmen who were in its path. The company has presented six medals in 10 years

Meetings

JOHN W. BOLTON, metallurgist, Lunkenheimer Co., Cincinnati, will address the second fall meeting of the Northeastern Ohio chapter of the American Foundrymen's association, to be held Oct. 17 at the Cleveland Club, Cleveland. Mr. Bolton will speak on "Heat Treatment of Gray Cast Iron".

A short period immediately following the dinner will be devoted to a discussion of the paper on "Merchandising Castings" presented at the September meeting of the chapter by J. H. Redhead, president, Lake City Malleable Co., Cleveland.

GLOBE AGENTS TO MEET

Globe Iron Co., Jackson, O., producer of silvery iron, will hold its annual meeting of agents Oct. 18-19. The program will be concluded with attendance at the Ohio State-Northwestern football game in Columbus, O.

Record Stainless Steel Plate Weighs 7500 Pounds

J. P. Devine Mfg. Co., Mt. Vernon, Ill., recently ordered from the Allegheny Steel Co., Brackenridge, Pa., what is claimed by the latter to be the largest single plate of stainless steel ever made.

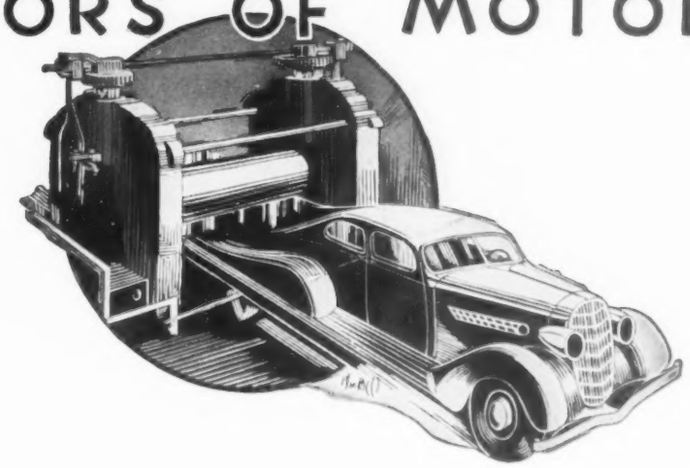
The plate, which weighs 7500 pounds, is 1 inch thick, 231 inches long, and 116 inches wide, was rolled from a single 5-ton ingot, for which special molds had to be made.

Necessary accessories are to be used with the plate, such as sheets, bars, tubes, and smaller plates, all of which are to be supplied by Allegheny at a combined weight of 12,000 pounds.

Mackintosh To Reorganize

Mackintosh-Hemphill Co., Pittsburgh, filed a federal court application for authority to reorganize under section 77B of the federal bankruptcy act Friday. Col. J. S. Ervin, president, states: "All three plants of the company are operating substantially at capacity on a profitable basis, but reorganization is advisable in an effort to adjust mortgage and other liabilities and to protect customers, employes, creditors and stockholders. The company now is employing about 1000 persons."

MIRRORS OF MOTORDOM



DETROIT

A YEAR ago Packard descended from the Olympian heights where prices are high, buyers haughty, and orders rarefied, to the $1000 plateau where customers are abundant if not of the socially-elect. The sequel in production: 9 months of 1934, 4431 units; 9 months of 1935, 33,844 units.

Last week Cadillac partially surrendered pride of class to money when it stocked dealers with a new V-8 priced at $1645 to $1725 by $700 the lowest it has offered a car since it became the blue stocking member of the General Motors family. Of course, in LaSalle, now further reduced, Cadillac has a direct entry against Packard.

This leaves only Lincoln and Pierce-Arrow still in the clouds. Lincoln, as rumored for many months, is planning to wedge in somewhere between Packard and Cadillac with a new V-12. There have been no reports, at least in Detroit, of Pierce climbing down.

Product of the Times

After all, the objective of an automobile manufacturer, like any other, is a profit, and while it may be swanky to cater to the social register there has been little nourishment in it for stockholders recently.

Even when lush times return, many owners who were crowded off the upland by economic necessity are not expected to return, so great are the values now available in the low and medium-price field.

So, for those who buy wheelbase, Packard, Cadillac and Lincoln still will have their top lines, but in the meantime their moderate-price lines are expected to provide bread and butter at least. In 9 months of 1935, Lincoln made 1400 cars, Pierce 1100.

This new Cadillac, on a 121-inch wheelbase and reputed to do 100 miles an hour in handy fashion, has a V-8 engine whose cylinder blocks and crankcase are cast in one piece believed to be the only one of its kind outside of Ford.

Engine and piston speeds are reduced from the 1935 Cadillac 8. The crankshaft is slightly larger, and six counterweights are used. Pistons are a new aluminum alloy. Much is claimed for the hydraulic lash, or valve tappet adjuster, in preventing tappet noises. A triple range choke combines manual control with automatic choking.

In this smaller model, as in the larger series, Cadillac goes to hydraulic brakes. On the 121-inch line it is mounting the duo-servo type. A ride stabilizer utilizes torsion rods on the rear wheels to eliminate sidesway. Center-point steering also has been adopted. Of course, front wheels are mounted on knee-action springs.

Generator Handles Overloads

A new type of generator, dubbed "peak load" is said to keep the battery fully charged and to compensate automatically for the demands of radio, heater, defroster, lights and other electrically-operated equipment. It is air-cooled.

The narrow radiator grille has a die-cast frame and center strip, but the cross fins are pressed steel. Incidentally, it was mentioned here last week that the new LaSalle grille would resemble the former half-circle grille of DeSoto before it went airflow. It is the small Cadillac, instead, that bears this resemblance.

Headlamps are mounted on brackets extending from the side of the radiator shell. Louvers are two parallel lines of vents. Fenders appear identical with the 1935 LaSalle type. The spare wheel and tire are carried at the bottom of the luggage compartment at the rear.

The emergency brake is under the dash, at the left of the driver. The instrument panel is metal, finished to match upholstery, and is set off by horizontal stripes. Just to the left of center is the speedometer, to the right an electric clock. Oil, gas, water and heat gages are in oblong dials directly in front of the driver.

The all-steel turret top is a little flatter than Fisher was making last year and is peaked in front where it blends into the V windshield. The twin windshield wipers are mounted at the bottom. The steering wheel is the three-spoke flexible type also used in Buick.

Cadillac is supplying this smaller series in a closed coupe with an opera seat directly behind the driver, a 4-door touring sedan, and a rumble seat convertible coupe at $1645, $1695 and $1725, respectively. The bottom price of Cadillac last year on a 128-inch wheelbase was $2345.

The new LaSalles are reduced $50 to $70 from 1935, in four models, ranging from $1175 to $1255. Fenders are unchanged from the second 1935 series, and such mechanical details as brakes, generator, triple-range choke, center-point steering, road stabilizer, instrument board, etc., are identical in the small Cadillac and in LaSalle. Bodies also appear to be from the same dies.

LaSalle goes to a die-cast radiator grille this year which, in general design, is little changed from the previous grille. The hood louvers are flow lines, like those of the new Buick, except that they are broken by five semicircular ports.

Await New Lincoln

When Ford brings out a new car, that's news. Except that schools and banks were not closed, the day late in December, 1927, when Model A was introduced as the successor to Model T was practically a national holiday.

This scene may be duplicated shortly when the new medium-price car sponsored by Lincoln is announced. No one in the United States can make page one of the newspapers more readily than Henry Ford, and the combination of this personality and a new car promises a real splurge.

Rumored as ready for introduc-

tion as long ago as midsummer, the delay is ascribed in a story now making the rounds in Detroit. This is that Mr. Ford, after personally putting the new model through severe tests, directed that 300 pounds be eliminated.

The story may be apocryphal, but it is characteristic of Mr. Ford's high standards, and lends support to rumors of unusual acceleration, top speed, and riding qualities. The new job is expected to be most competitive with the new low-price Packard.

Lincoln dealers and most Ford dealers are expected to handle it. The betting in Detroit is that it is a V-12 and will be called Lincoln, but no potential name has been overlooked in suggestions made by Ford aides.

Ford last week stepped up production on 1936 models, initiated the week preceding, and turned out 3000. Dealers generally were "sampled" last week, and the public announcement and showing by dealers are scheduled for Tuesday. The 1936 Ford trucks delivered to dealers last week were equipped with mechanical brakes.

Olds Books Orders for 1936

Olds last week began dealer showings of its 1936 sixes and eights, and while prices were not announced orders were being booked at 1935 quotations on the basis of a guarantee of no increase, and a rebate in case of reduction.

Wheelbase, engine dimensions, and other principal mechanical specifications are unchanged. Aluminum alloy pistons have succeeded the cast iron ones. The all-steel turret top is a little flatter. Tires on the six are larger, being 6.50 x 16 against 6.25 x 16 last year; on the eight they remain 7.00 x 16.

Louvers on both the eight and the six have been radically revised. They now consist of three sets of three small round bright closures over small ports at the rear of the hood where the side and top join. The real ventilation is provided by openings underneath the fenders, which are generally unchanged.

The radiator grille continues die cast and substantially the same as for 1935 except that the grille on the six has four evenly-spaced cross ribs while the grille on the eight has a center rib and a bracket of two ribs above and two below.

Headlamps are mounted on struts projecting from the side of the radiator shell, as previously noted for the new Cadillac and the LaSalle. The eight mounts bullet parking lamps on the front fenders, somewhat similar to the new Buick. The instrument board has been redesigned, and the hand brake lever is hung from the dash, at the driver's left.

Hudson-Terraplane last week was in the second week of production on its 1936 lines, and is speeding up as rapidly as possible. In addition to mechanical improvements, many of which were detailed here last week, this manufacturer will stress what it terms automatic draft elimination.

Just above the rear axle, in the body floor, an opening has been made and screened with cloth. When a window is opened, and the air in the car withdrawn by vacuum, this air is replaced by that drawn through the screen. The result is that door and window openings can be made and kept airtight, and drafts are claimed to be eliminated.

Engines in the Hudson and Terraplane lines are unchanged in dimensions. Both the Terraplane deluxe and custom models have wheelbases of 115 inches, an increase of 3 inches over 1935. The wheelbase of the Hudson six has been stepped up from 116 inches to 120, and of the two Hudson eights from 117 and 124 inches to 120 and 127.

Push Production Lines

Chrysler's chief effort last week also was to whip up production as quickly as possible. The total for all divisions was 9000, which was composed chiefly of Dodge and Plymouth units. The latter was generally described here last week, and the former two weeks ago.

Chrysler's total of 9000 units last week was almost double the 5500 of the week preceding, and indicates that this year as last Chrysler is beating many of his competitors to stocking of dealers and fortifying them to book early orders.

Plymouth is using more steel in its 1936 frame. The depth of the side rails and X-brace members has been increased from 5 inches to 5½, box sections at the rear have been extended and those at the front widened. Previously, the X-brace intersection was made up of four sections; now it is one unit. At the front, a heavy gage straight crossmember is used instead of a Y-member.

There is a hint in Detroit that although Plymouth will be hailed as "the peak of perfection" and Dodge as "the beauty winner of 1936", this by no means exhausts the Chrysler vocabulary of superlatives.

Neither the airflow Chrysler or DeSoto having achieved real quantity production, the big push in 1936 will be on the more-conventional airstream series of both cars. The appearance of both has been considerably changed. DeSoto has gone to round ports—three on each side. Interior trim of both series has been greatly enriched.

The airflow jobs of both Chrysler and DeSoto are unchanged for 1936 save for a few minor refinements of lines. Incidentaly, Chrysler this year is talking of Amola steel instead of Mola. The steel is said to be practically unchanged in specification but the name was modified to meet the suggestion of a producer of molybdenum.

Steel Floor in Pontiac

Pontiac, whose production has been put up to over 2500 units weekly, is another car whose principal style change for 1936 is a revised radiator grille. The characteristic "silver streak" is continued, from the cowl to the bottom of the grille, but the angle at the radiator is more acute, and instead of parallel vertical lines on the grille itself there are steel horizontal fins colored the same as the body. This gives the radiator a narrower appearance.

An increased use of steel in the new Pontiacs is a solid steel floor. As in Olds and Buick, the arm rests on the front doors are slotted, permitting their use in closing the doors. This year the instrument board has been toned up by the use of black figures on an ivory background. The crown of the fenders has been accentuated. Engine dimensions and wheelbase are unchanged. There are two sixes and an eight.

General Motors' total output last week was 11,625 units, only 375 more than in the preceding week. Olds is humping along at just short of 4000 units a week, Pontiac is just above 2500, Buick at about 3250, and Cadillac-LaSalle at 850, which leaves a scant thousand or so for Chevrolet. However, Chevrolet was still producing and selling 1935 models in good volume after its competitors had closed.

Willys expects to start on its final run this week.

Studebaker also is scheduled to resume this week, on new models.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,321
July	229,357	264,933	337,044
Aug.	232,855	234,811	240,051
Sept.	191,800	170,007	*77,000
9 mo.	1,634,126	2,384,014	*2,916,240
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

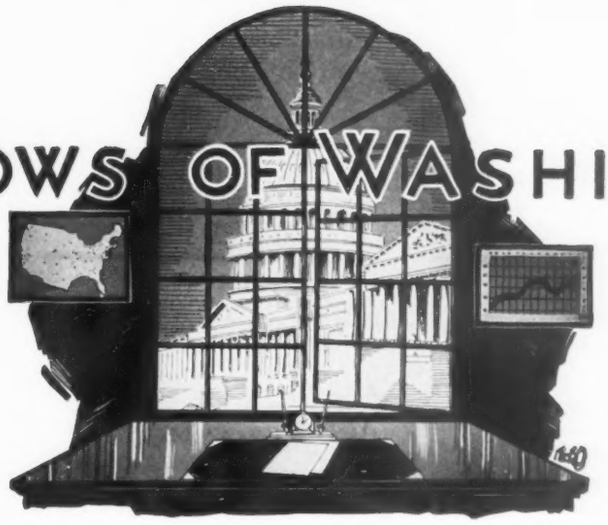
*Estimated.

Estimated by *Cram's Reports*

Week ended:

Sept. 21	12,600
Sept. 28	15,994
Oct. 5	24,770
Oct. 12	31,643

WINDOWS OF WASHINGTON



WASHINGTON

A LETTER was sent last week to the American Iron and Steel institute, to other steel and allied trade associations, to Myron C. Taylor, chairman, United States Steel Corp., Eugene G. Grace, president, Bethlehem Steel Corp., and to other leaders in the industry by Maj. George L. Berry, recently-appointed co-ordinator for industrial co-operation, asking if they will attend a round table conference "for consideration of the best means of accelerating industrial recovery, eliminating unemployment, and maintaining business and labor standards."

While no announcement has been made it is reported that Major Berry would like to call the conference the latter part of this month, in Washington. There is also a feeling that, regardless of whether or not the answers are favorable, such a conference will be called.

Details To Be Ironed Out

Two major decisions are yet to be made in connection with the proposal.

One is whether a general conference will be called of both industry and labor, later to be divided up into groups for round table discussions, or whether separate conferences shall be called for related industries.

The second question is, whether industry will be asked to sit around a table to discuss questions with labor. These two questions are now before Major Berry and his lieutenants for final consideration.

In sending his communications to industry, Major Berry has attached the letter which President Roosevelt wrote just before the adjournment of congress to Sen. Pat Harrison, chairman of the senate finance committee, and Representative Doughton, chairman of the house ways and means committee, in which he expressed hope that voluntary agreements can be made by industry.

"It will be observed that the men of industry," says Major Berry, "both in managerial and labor capacities will be invited to Washington for the purpose of conferring upon the advisability of developing a permanent structure, contemplating the furtherance of prosperity and stability in our industrial life.

"It is my belief that conferences of the character suggested by the President, at which frank discussion of the problems can be had with the hope that understandings can be arrived at, will be of lasting benefit. In a word, these conferences are intended to identify the facts and to act upon these facts intelligently and constructively."

NRA has announced that it has received labor provisions for voluntary codes from the federal trade commission for seven industries, including wholesale tobacco, asbestos, asphalt shingle and roofing, solid braided cord, rock and slag wool, ladies handbags, and the fertilizer industries.

NRA STUDY OF IRON, STEEL, A "KEY" ONE, MAKING PROGRESS

NRA executives feel that the study they are making of the iron and steel industry is the most important of any of their industry surveys. It is progressing rapidly and there is every hope that it will be in good form by the end of this year as called for by the President.

The steel industry study in its revamped form covers (a) corporate structure and control, (b) financial structure and financing methods, (c) nature of competition within the industry, (d) technological progress (e) employment and earnings of labor, and (f) policies and practices with regard to purchasing, distribution and labor relations.

NRA officials say that special attention is being devoted to those major problems of the industry, which occasioned the President's approval of the code in the form in which it was finally presented to him by the industry, including those of the basing point system, standard extras, productive capacity, prices and selling practices, etc. These problems will be treated in the study in their natural economic setting and also as they may have been influenced by code provisions.

It is stated that substantial progress has been made in assembling statistical data which will permit of a complete history of labor in the industry, together with up-to-date reports on hours, wages, and accident records.

In the field of corporate and financial conditions, material has been assembled which will reveal the history of corporate matters and the current corporate condition respecting property, ownership, management and control.

The field of competition is being studied from the point of view of conditions existing prior to the code, during the code, and to a lesser extent during the post-code period. One of the questions being taken up is the competition between integrated and nonintegrated producers.

Data from Varied Sources

Sources of information are NRA files, department of commerce, department of labor, security and exchange commission, treasury department, American Iron and Steel institute, Amalgamated Association of Iron, Steel and Tin Workers, and individual member companies of the industry.

In accordance with the declared policy of the NRA review division, the study is being conducted as an objective search for facts and not as an endeavor to obtain evidence in support of any preconceived social or economic theories—so it is claimed.

In accordance with the request of the President, a certain amount of basic material will be available by Dec. 1 for submission to the committees of congress for their consid-

eration in connection with possible legislation at the next session.

This study is headed by R. W. Shannon with the aid of Arthur Sturgis, H. L. Brunson, Burr T. Ansell, John E. Skilling, Alexander Tucker, Prof. M. P. Sharp, special adviser; Prof. Charles F. Marsh, R. C. Lisk, F. H. Phipps Jr., A. H. Howe, Luther Becker, Thomas Biddle, Prof. J. M. Clark, special economic adviser; Prof. Bradley Stoughton, special adviser in technical and metallurgical field; and Prof. Richard N. Owens, adviser in financial field.

A report was current in Washington Friday that Major Berry has told some industrialists that he intends to put an immediate stop to the NRA studies of steel and other industries. Major Berry was out of Washington Friday, but Leon C. Marshall, in charge of studies, denied the report. It is claimed that these studies were initiated by executive order and can be stopped only by a rescinding of it.

THEY'RE VOLUNTARY CODES IF LABOR CLAUSES ARE ADDED

Federal trade commission is now designating trade practice conference rules which include labor provisions as voluntary codes.

Information available at the offices of the commission—and it is very sparse on this subject—is to the effect that at this time 33 industries have asked formally for trade conferences or voluntary agreements. The commission does not separate the two in announcing this number.

It is also stated at the commission that 145 other industries have made preliminary inquiries of the commission regarding trade conferences, but have not definitely committed themselves in any way.

In connection with the labor provisions, it is interesting to note that the commission has recently finally approved the trade rules for the wholesale tobacco industry. No labor provisions were included, but, it is rumored here, that industry will ask for labor provisions in the near future, thereby changing its trade practice rules into a so-called voluntary agreement.

TRADE PACT WITH COLOMBIA FAVORS STEEL PRODUCTS

The trade agreement between the United States and Colombia has been officially announced. It has yet to be confirmed by President Roosevelt and by the legislature of Colombia.

In the case of metals and their manufactures, reductions are provided in the rates for our exports of plain and galvanized iron and steel sheets, tin plate, and steel furniture.

The reductions to be granted in this group range from 25 to 87½ per cent of existing rates. The present favorable rates of duty have been bound against increase in the case of some types of iron and steel pipes and fittings, tin plate for canning, structural steel and numerous types of hardware including screws, nails, chains, etc.

MACHINERY EXPORT GAIN A HERALD OF WORLD RECOVERY

A gain of 22 per cent in exports of industrial machinery in the first half year is heralded in Washington as a sure indicator that world recovery of business is definitely on its way and that the present upswing in the United States is the first wave of this comeback lapping our shores. Recovery, you know, is supposed to flow from East to West, and the bulk of the improvement in exports has originated in Europe or to the East.

In the first half of 1935 exports of industrial machinery totaled $54,591,321, compared with $44,812,907 in the first half of 1934. Leading this total for 1935 is mining, well and pumping machinery at $14,107,148. A close second was power-driven metalworking machinery at $11,113,900.

REAFFIRMS SCRAP STANDARD

The division of simplified practice of the bureau of standards has announced that simplified practice recommendation R58-28, the classification for iron and steel scrap, has been reaffirmed without change by the industry's standing committee.

This recommendation was first approved at a general conference of the industry in 1926, with the first revision becoming effective on Jan. 1, 1928, and has since been in effect.

The recommendation specifies the classes of scrap for blast, basic open-hearth, acid open-hearth, and electric furnaces, for gray iron foundry practice, bessemer converters, and for miscelianeous scrap. A contract form for purchase of scrap also is included.

Died:

JOSEPH M. BARTON, 53, vice president and general manager of the Dearborn Stamping Co., Dearborn, Mich., in that city, Oct. 7. Before going with the Dearborn company where he had been vice president for four years, he was active at Kelsey-Hayes Wheel Corp. for 19 years.

♦ ♦ ♦

George Nelson Bartley, 70, organizer of the Wood Sales & Service Co. and the Hoosier Body Co., Indianapolis, recently.

♦ ♦ ♦

Ignatz Benesch, 67, founder of the Benesch Iron & Steel Co., Milwaukee, and a pioneer in the wholesale scrap metal business, Oct. 6.

♦ ♦ ♦

William C. McCausland, 74, former treasurer and director of the Carnegie Steel Co., Pittsburgh, and retired for the past four years, in Pittsburgh, Oct. 4.

♦ ♦ ♦

Frank M. Sheldon, 75, senior partner, Braman Dow & Co., steam fitters and pipe supply concern, Boston, and with that company for more than 50 years, in Lexington, Mass., Sept. 24.

♦ ♦ ♦

George S. Phillips, a partner in the firm of W. S. Horner & Co. and formerly vice president and secretary of Pittsburgh Shovel Co., as well as founder and president of the American Shovel institute, in Pittsburgh recently.

♦ ♦ ♦

J. S. Gillespie, president, American Hollow Boring Co., Erie, Pa., in Cleveland, Oct. 8. Since its organization in 1918, he had been president of the company, which specializes in hollow bored forgings and steel shafts.

♦ ♦ ♦

Eugene R. Grasselli, 63, former vice president and treasurer of the Grasselli Chemical Co., Cleveland, in Santa Barbara, Calif., Oct. 5 The third generation of a family long identified with the chemical industry, he was an executive of the company until 1928 when it was merged with E. I. duPont de Nemours & Co. Inc., Wilmington, Del.

♦ ♦ ♦

Harold N. Spicer, 70, a director of the Dorr Co. Inc., mining engineer, New York, in that city, Oct. 8. Born in England, he worked at mining engineering in India, Tasmania and later Australia, in the latter country for the Broken Hill Mining Co. Then he went to South Africa, Straits Settlement, Turkey, Russia, Siberia and subsequently the United States. He joined the Dorr organization in 1911.

♦ ♦ ♦

Oscar Junggren, 70, associated with the development of many of the most important advances in the design of large steam turbines and until recently design engineer of the General Electric Co.'s turbine department, in Schenectady, N. Y., Sept. 24. Born in Sweden, he came to New York in 1889, going with General Electric in 1891. In the eight years from 1924 to 1932, some 30 new turbines, each an entirely new design, were developed under his direction.

♦ ♦ ♦

Arthur H. Buhl, of Detroit, president of Buhl Sons Co., whose death was noted in STEEL recently, was a grandson of Christian Buhl, prominent in the steel industry in Sharon, Pa., and the son of Theodore Buhl, one of the organizers of the Detroit Copper & Brass Rolling Mills. When the Buhl Steel Co., of which the late Arthur H. Buhl was secretary, was sold to the National Steel Co. in about 1900, he went to Detroit to enter the Buhl Sons Co., of which he later became president, and was also president of the Buhl Stamping Co.

Industrial Men in the News

James L. Wick Jr., Elected Vice President, The American Foundrymen's Association

A native of Youngstown, he has spent there his business life following graduation from Boston Tech.

Since 1919 he has been with the Falcon Bronze Co., and since 1925 has served as its president.

For many years he has been active in the A.F.A., on committees and as a director.

JAMES L. WICK, JR., president and general manager, Falcon Bronze Co., Youngstown, O., and a director of the American Foundrymen's association, has been elected vice president of the association to fill the vacancy occasioned by the recent death of the association's vice president, B. H. Johnson.

Mr. Wick has been active in the association for many years, serving on committees and as a director. He was born in Youngstown, O., in 1883, and received his technical training at the Massachusetts Institute of Technology, graduating in 1906 with a bachelor of science degree in mechanical engineering. During summer vacations he worked in the plant of the William Tod Co., Youngstown, now a unit of the United Engineering & Foundry Co., Pittsburgh.

Following graduation, he became associated with the Youngstown Sheet & Tube Co., and also with the Natural Light & Thorium Co. as assistant superintendent. In 1908 he became general manager and treasurer, Crystal Ice & Storage Co., and designed and rebuilt its plant.

He returned to the Youngstown Sheet & Tube Co. in 1918 for a short time as special agent for claims, and in 1919 became connected with his present firm, the Falcon Bronze Co., as secretary and assistant general manager. He became president and general manager in 1925.

In addition to membership in the A.F.A., Mr. Wick is a member of the American Iron and Steel institute, American Institute of Mining and Metallurgical Engineers, American Society for Testing Materials, and National Founders' association.

E. H. Ballard, General Electric Co., West Lynn, Mass., has been elected to the board of directors of A.F.A. to fill the unexpired term of Mr. Wick. Mr. Ballard is a past president of the association.

The following members of the board were elected members of the executive committee to serve with the president, vice president, and executive secretary: Frank J. Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh; R. J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.; E. O. Beardsley, Beardsley & Piper Co., Chicago; and W. L. Seelbach, Forest City Foundries Co., Cleveland.

F. A. Beatty

Chief engineer of the Lewis Foundry & Machine Co., Pittsburgh, since 1927, who as announced in STEEL for Sept. 30 has been named a director of the company, a subsidiary of Blaw-Knox Co.

♦ ♦ ♦

Frank W. Jones, who has been a director, vice president and general manager of the Hanover Wire Cloth Co., Hanover, Pa., since July 31, 1931, was elected president Oct. 1.

Mr. Jones began his career in 1901

Frank W. Jones

with the H. W. Middleton Co. Three years later he joined the Philadelphia district sales organization of the Carnegie Steel Co. Remaining here five years, he left to become associated with the Eastern Steel Co. in the capacity of manager of sales for the Philadelphia district, including the South and Pacific Coast. He also was general manager of sales for the Warwick merchant pig iron furnaces at Pottstown, Pa., operated by the Eastern Steel Co. until the lease was cancelled in 1926, followed by dismantling of the furnaces.

Mr. Jones is also president of the Wire Cloth Manufacturers' institute.

♦ ♦ ♦

J. H. Van Campen, special engineer for Republic Steel Corp., Youngstown, O., has been appointed chief engineer of the Corrigan-McKinney division. Mr. Van Campen will assume his new duties immediately in Cleveland.

He is a graduate of Pratt institute with the degree of mechanical

engineering. After working as a structural iron worker in New York and on a railroad, he joined Bethlehem Steel Co. in 1911 as engineer of the Soucon plant, where he remained for six years. From there he went to the Weirton Steel Co., Weirton, W. Va., as chief draftsman.

Starting in 1920, he was five years assistant chief engineer with the Midvale Steel & Ordnance Co., Coatesville, Pa., and then became special development engineer for the Timken Roller Bearing Co., working particularly on large roller bearings for mills. Subsequently he became chief engineer of the E. W. Bliss Co. at Salem, O., where he remained for two years. This was followed with four years as chief engineer for the Youngstown and Warren districts of Republic. He then spent a year in Japan doing special work for the United Engineering & Foundry Co., returning to Republic as special engineer.

♦ ♦ ♦

J. R. Edwards, 719 Gulf building, Pittsburgh, recently has been appointed Pittsburgh representative for the Hammond Iron Works, Warren, Pa.

♦ ♦ ♦

R. H. Butler has been appointed advertising and sales promotion manager for the Anderson Co., Gary, Ind., manufacturer of automotive products.

♦ ♦ ♦

Roy M. Atwater has been appointed sales engineer for the Salem Engineering Co., Salem, O. He was formerly associated with the W. S. Rockwell Co., and more recently with the General Alloys Co.

♦ ♦ ♦

W. J. George was appointed assistant sales manager of the Edgewater Steel Co., Pittsburgh, effective Oct. 1. Mr. George has been connected with the Edgewater company for over 18 years, and his experience covers both the operating and sales departments.

♦ ♦ ♦

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., has been elected a member of the executive committee of the board of the American Iron and Steel institute, New York, succeeding George M. Verity, chairman of the Rolling Mill company, who has resigned as a director. Mr. Verity's term as director would have expired in 1937.

Donald B. Gillies, former president of the Corrigan, McKinney Steel Co. and now vice president of the Republic Steel Corp., Cleveland, has resigned as director of the Institute. His term expired in 1936.

♦ ♦ ♦

Clarence Gilchrist has been appointed assistant manager of sales in the Cleveland district for the American Steel & Wire Co., succeeding Paul B. Gilroy, who as announced in STEEL Sept. 30, has been named manager of sales. Mr. Gilchrist has been associated with the Cleveland office for many years.

♦ ♦ ♦

T. Frank Webster, formerly associated with the Philadelphia office of the Link-Belt Co., Chicago, has been appointed resident manager of the Boston office, succeeding Horace Goldstein, who has been assigned to engineering sales work at the Philadelphia office. Mr. Webster at one time was Link-Belt resident manager at Pittsburgh.

♦ ♦ ♦

Maurice Schlafer, of Schlafer Iron & Metal Co., Detroit, was elected president of the Michigan chapter of the Institute of Scrap Iron and Steel, Oct. 3. Other officers elected include H. Lenick, of E. Lenick & Co., Saginaw, Mich., vice president; H. Goldman, Riverside Scrap Iron & Metal Co., Detroit, secretary-treasurer.

♦ ♦ ♦

Arthur Meyer, West Virginia Rail Co., Huntington, W. Va., and Robert Wright, Standard Ultramarine Co., Huntington, W. Va., and some members of the Pittsburgh Purchasing Agents' association are actively interested in forming a purchasing agents' association including southern West Virginia, southeastern Ohio, and northeastern Kentucky.

♦ ♦ ♦

Dr. John F. Thompson, vice president of the International Nickel Co of Canada Ltd., sailed last week for Paris where he will be chief delegate of the Mining and Metallurgical Society of America to the seventh International Congress of Mines, Metallurgy and Applied Geology, and a member of the delegation from the American Institute of Mining and Metallurgical Engineers.

He will present a paper to the congress, which will meet in Paris the week of Oct. 21, on "Ten Years' Progress in the Metallurgy of Nickel."

Karl W. Gass

Who as noted some time ago in STEEL is chief engineer of the Amsler-Morton Co., Pittsburgh. A native of Pittsburgh, and graduate of Cornell, he was formerly with the United Pump & Power Co., Chester & Fleming, and Fort Pitt Engineering Co., specializing in design. He is a member of the Engineers Society of Western Pennsylvania.

♦ ♦ ♦

Jerome R. George Jr., formerly vice president of the Morgan Construction Co., and active in civic affairs in Massachusetts, has been elected president of the Aetna-Standard Engineering Co., Youngstown, O.

♦ ♦ ♦

David E. Jenkins, assistant to B. F. Fairless when the latter was vice president of Republic Steel Corp., has been appointed assistant to Mr. Fairless in his new capacity as president of Carnegie-Illinois Steel Corp., Pittsburgh. Mr. Jenkins' former associations have included American Sheet & Tin Plate Co., Timken Roller Bearing Co., United Alloy Steel Corp., and Central Alloy Steel Corp.

James J. Garvey, formerly employed in secretarial duties with I. Lamont Hughes, W. A. Irvin, and Ambrose N. Diehl in United States Steel Corp. offices in New York, has been appointed secretary to Mr. Fairless.

♦ ♦ ♦

Further appointments by the new Carnegie-Illinois Steel Corp. include:

O. M. Havekotte as credit manager at Pittsburgh, and J. D. Robinson and C. F. Seibert Jr. as assistant credit managers.

N. E. Crull as credit manager at Chicago, and F. H. Becker as assistant credit manager.

Griswold A. Price as manager of sales of the bar, strip and semifinished division, and A. H. Warren Jr. as manager of sales of the structural and plate division.

J. Halsey McKown as assistant vice president at Pittsburgh, and Joseph C. Shields as office manager at Pittsburgh.

♦ ♦ ♦

Clarence B. Randall, a vice president of the Inland Steel Co., Chicago, in charge of raw materials and Great Lakes freighters, has been elected a director of the company. He was graduated from Harvard in 1912, and was associated with the Cleveland-Cliffs Iron Co. at Ishpeming, Mich., from that time until he came to Inland on Aug. 1, 1925, with the exception of the two war years, during which he served overseas as a captain of infantry.

Mr. Randall first was an assistant vice president of Inland, and was elected a vice president in April, 1930. He is president of the Inland Lime & Stone Co. and an officer of other raw materials subsidiaries of Inland.

EDITORIAL

Steel Frame House Situation Is Ripe for Positive Action

DEVELOPMENTS in the application of steel to housing rapidly are approaching the point where something more tangible than experimental pioneering effort is demanded. If the iron, steel and metalworking industries are to capitalize fully upon the rich opportunities which await them in this field, they must act promptly and positively.

This will be apparent to anyone who investigates the present status of the market for medium priced homes. Reliable surveys show that about 14,000,000 families are living in houses valued at from $2000 to $10,000. Allowing for the growth of population and for the replacement of destroyed or worn-out dwellings, a conservative estimate places the annual requirements for new houses within this price range at 500,000 annually.

Progress during the past decade has brought steel so definitely into the picture as an ideal material for small house construction that today it is possible to say positively that public acceptance for the intelligent use of steel has been widely established. Prominent architects and contractors, who once were skeptical in regard to the successful application of steel to residences of moderate cost, now are enthusiastic in their conviction that it furnishes the answer to many of the current housing problems.

Steel Frame Offers Greatest Economies

A competent investigation, made some years ago, indicated that the waste in building operations on orthodox lines averaged 53 per cent.

An analysis of costs shows that the greatest opportunities for saving in the physical construction of a house lie in the frame or "chassis." By using steel for framing it is possible to introduce the idea of prefabrication in a way which not only satisfies every requirement of architectural taste, beauty and individuality, but also provides a structure of higher quality at equal or less cost than orthodox construction and one that is better adapted to the installation of the heating, lighting and mechanical equipment of modern homes.

That houses of this type possess a strong appeal to prospective home owners has been demonstrated thoroughly in many sections of the country. The reception already accorded the steel frame house indicates that once the idea gains sufficient momentum so that the economies of prefabrication of the structural members can be realized more fully, the price differential in favor of the steel frame house will become a more powerful factor in its favor. In other words, volume will reduce cost.

Here one senses an analogy between the steel frame house and the automobile. Volume had little to do with the cost of houses of the conventional type. The average cost of a home was $2173 in 1909, $4966 in 1930 and $4020 in 1934. Contrast this with the fact that the average cost of an automobile was $1662 in 1902 and $678 in 1934. The car of 1934 was far superior to its expensive predecessor of 1902, because of greater efficiency in manufacture, distribution and finance, which in turn was due in large measure to increased volume.

Need Central Organization To Co-ordinate Effort

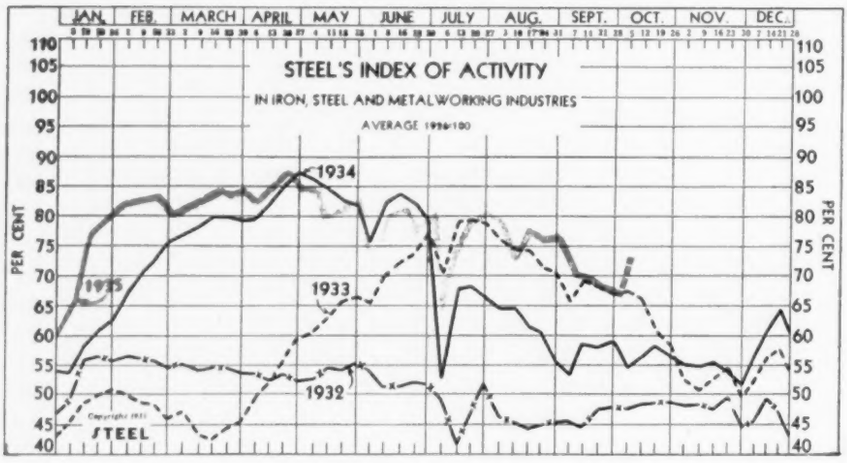
Experts who have given close attention to the housing problem are convinced that the prefabricated frame principle affords the key by which the steel and affiliated manufacturing industries can unlock the door to the potentially rich small home market. Assuming that the frame will average four tons per house, the immediate potential demand is at least 2,000,000 tons of steel annually. To this tonnage should be added the steel which will be required for plumbing, heating, air conditioning, etc.

With its hundreds of millions of dollars invested in new rolling mill equipment, it would seem that the steel industry cannot afford to ignore this opportunity to create a new market. Either on its own initiative, or through co-operation with the manufacturers of home appliances and equipment, it should take steps immediately to perfect the necessary organization for developing the modern prefabricated steel frame house to its utmost possibilities.

This may involve a venture into fields of merchandising which are new to steelmakers. It may necessitate the formation of one or more housing corporations and possibly a central financing agency. In its simplest dimensions, it will call for an instrumentality for co-ordinating the efforts of manufacturers, architects and contractors. But whatever it requires, the cost will be infinitesimal compared with the current appropriations for new mill capacity.

Steel producers have not hesitated to protect their stake in existing markets by acquiring customers by the merger process. They may well give thought to the idea of creating new markets by methods which the automobile industry has proved profitable.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries increased 4.5 points to 73.0 in the week ending Oct. 5.*

Week ending	1935	1934	1933	1932
July 27	80.8	66.4	78.8	46.1
Aug. 3	78.4	64.6	75.9	45.1
Aug. 10	73.4	64.6	74.7	44.6
Aug. 17	77.5	61.4	74.2	44.9
Aug. 24	77.0	60.3	71.6	45.2
Aug. 31	77.3	55.1	70.3	45.4
Sept. 7	70.9	53.5	65.5	44.9
Sept. 14	70.1	58.7	69.1	47.8
Sept. 21	69.4	58.1	68.2	48.0
Sept. 28	68.5†	59.3	66.9	47.7
Oct. 5	73.0*	54.7	67.4	48.4

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL.) *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

All-Time Power Output High, Heavier Loadings Heartening

STRENGTH was predominant in factors going to make up STEEL'S index of business activity for the week ended Oct. 5.

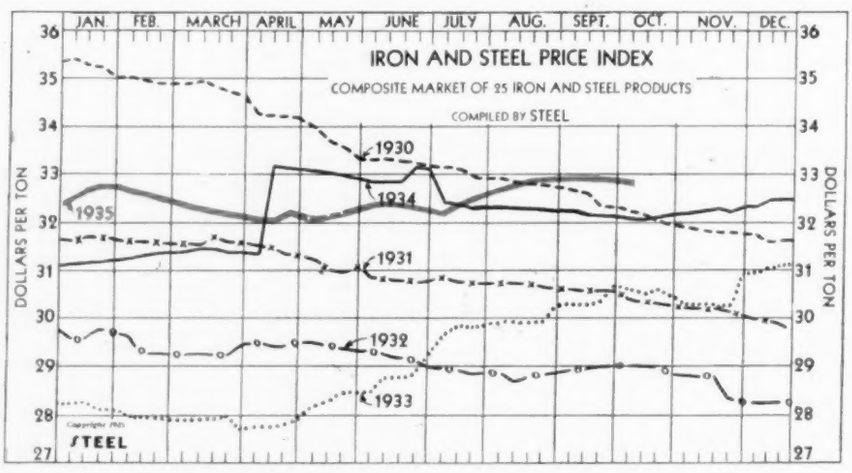
It was more than strength, in fact, that was displayed by power output, for that important barometer broke through the previous high of the week ended Dec. 21, 1929, and set an all-time record. This unprecedented output was 1,863,483,000 kilowatt hours; it exceeded the preceding week by 9,000,000 hours. This indicates that industrial machinery is moving.

Freight car loadings, increasing to about 695,100, topped the previous week by some 67,000 cars, and while it was not a record and fell a little short of the second and third week of September, nevertheless, barring these two weeks, the annals of the railroads must be searched as far back as early November, 1931, to find an equal.

Another increase in automobile assemblies is a harbinger that the changeover period to 1936 models is at an end, and that, with very few exceptions, all manufacturers are attempting to attain high production as rapidly as possible.

Steel Price Index Steady, Just Above 1934

1935	
Oct. 5	$32.82
Sept. 28	32.83
Sept. 21	32.83
Sept. 14	32.81
Sept. 7	32.79
Aug. 31	32.78
Aug. 24	32.72
Aug. 17	32.68
Aug. 10	32.64
Aug. 3	32.59
July 27	32.55
July 20	32.42
July 13	32.40
July 6	32.39

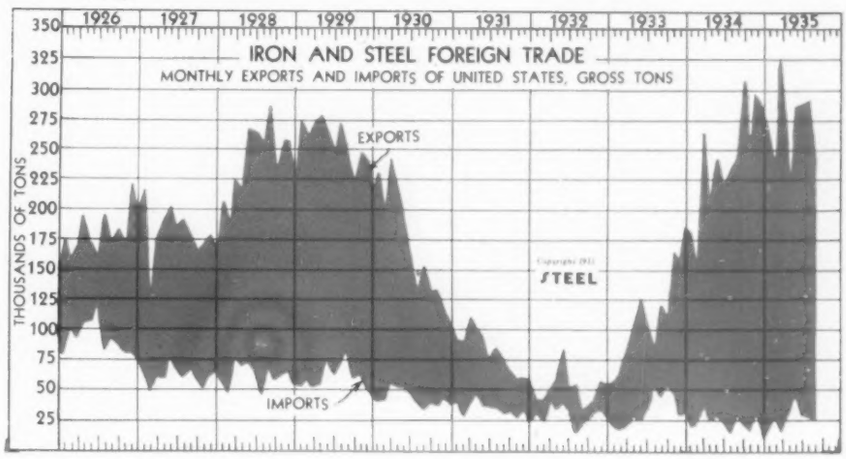


1934	
Oct. 6	$32.09
Sept. 29	32.13
Sept. 22	32.13
Sept. 15	32.14
Sept. 8	32.17
Sept. 1	32.17
Aug. 25	32.22
Aug. 18	32.23
Aug. 11	32.23
Aug. 4	32.28
July 28	32.28
July 21	32.28
July 14	32.33
July 7	32.38

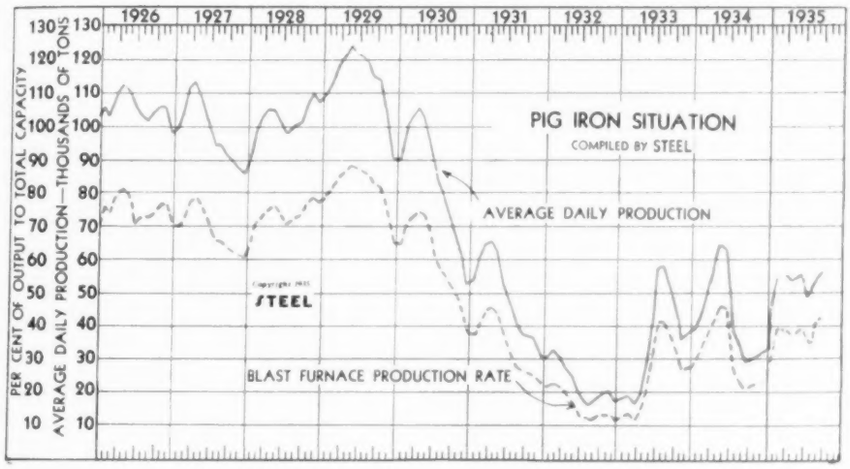
August Foreign Trade Balance Is Less Favorable

Gross Tons

	1935 Imports	1935 Exports	1934 Imports	1934 Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,260
April	28,866	205,336	26,862	201,539
May	47,719	286,598	29,465	241,753
June	33,208	289,687	24,848	219,406
July	31,894	296,802	17,676	233,186
Aug.	31,312	247,312	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764



Daily Iron Output Rate Best in 14 Months

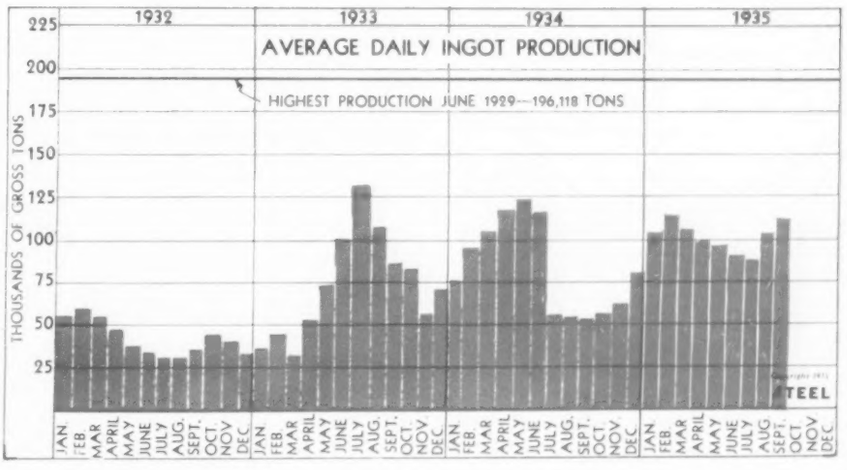


	Daily Average 1935	Daily Average 1934	Blast Furnace Rate 1935	Blast Furnace Rate 1934
Jan.	47,692	39,537	34.2	28.3
Feb.	57,686	45,385	41.4	32.5
Mar.	57,120	52,438	41.0	37.5
April	55,719	57,873	40.0	41.4
May	55,986	66,370	40.2	47.5
June	51,949	64,563	37.2	46.3
July	49,043	39,630	35.2	28.4
Aug.	56,767	34,199	40.7	24.5
Sept.	59,009	29,969	42.5	21.5
Oct.	.....	30,689	.....	22.1
Nov.	.....	31,930	.....	23.8
Dec.	.....	33,161	.....	23.7

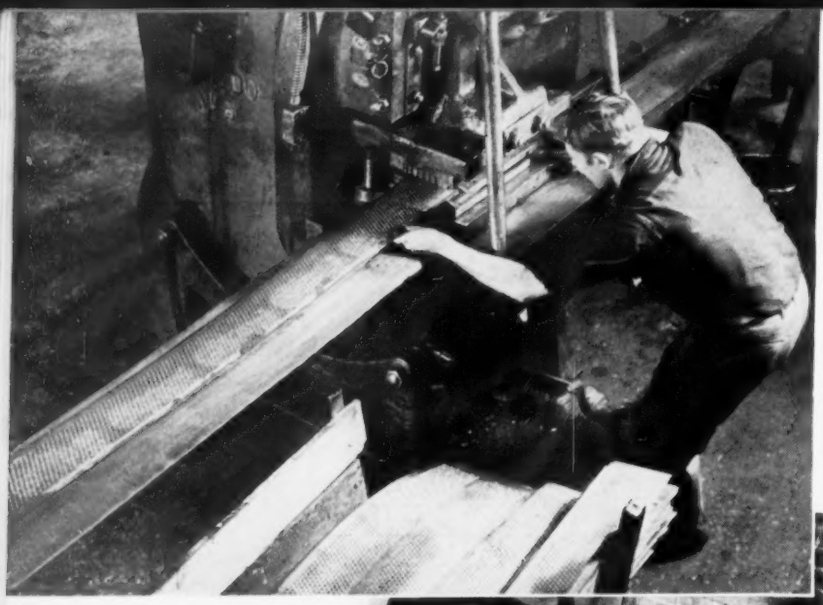
September Ingots Second Best in 1935

Gross Tons

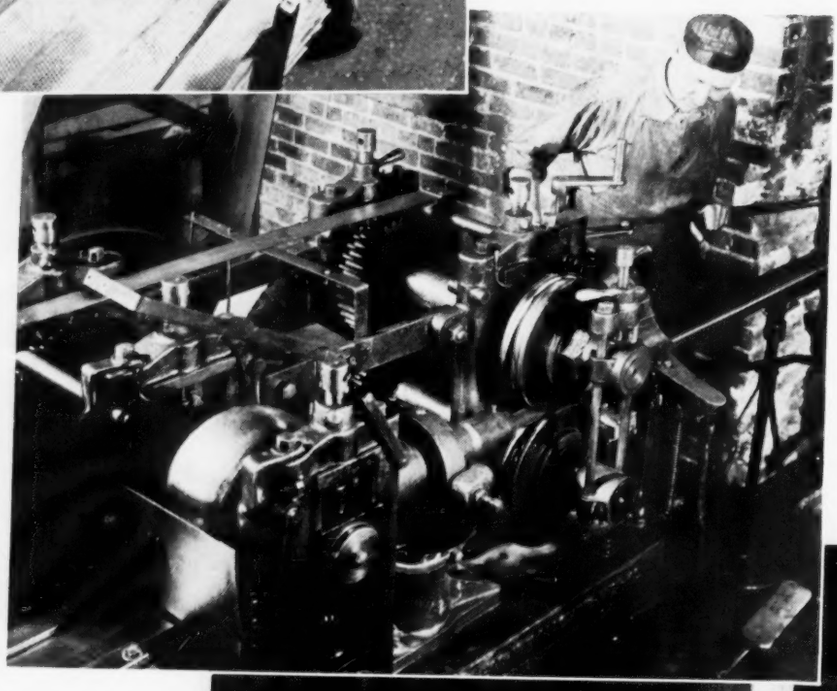
	1935	1934	1933
Jan.	106,353	73,968	39,110
Feb.	115,740	92,164	44,709
March	110,313	103,646	33,268
April	101,558	117,443	53,817
May	97,624	125,907	73,201
June	89,236	117,672	98,632
July	87,316	59,578	126,734
Aug.	108,123	51,161	106,058
Sept.	113,193	50,759	87,811
Oct.	.....	54,885	80,188
Nov.	.....	61,947	58,507
Dec.	.....	78,570	71,944



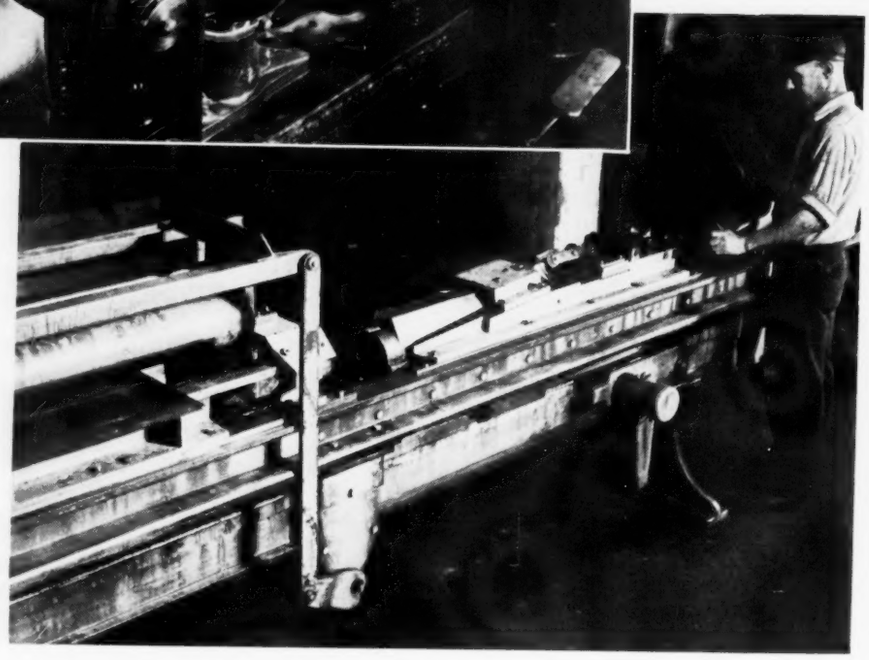
Rolling, Forming Steps in Making



ABOVE is shown the operation of stamping louvers in strips preparatory to cutting them to length and forming into tubes for mufflers. At right is shown a tube mill forming exhaust pipe from cold-rolled strip



EQUIPMENT below is known as a Stolp machine for forming outer muffler shell. The inner louvered shell is formed similarly



ROLLING, forming and welding machines aid considerably in attaining high-speed production of exhaust mufflers for automotive use. Because of the variety of types and dimensions of mufflers employed by different cars and trucks, it is desirable that equipment for fabrication of these parts be easily adaptable to the production of the entire range of sizes.

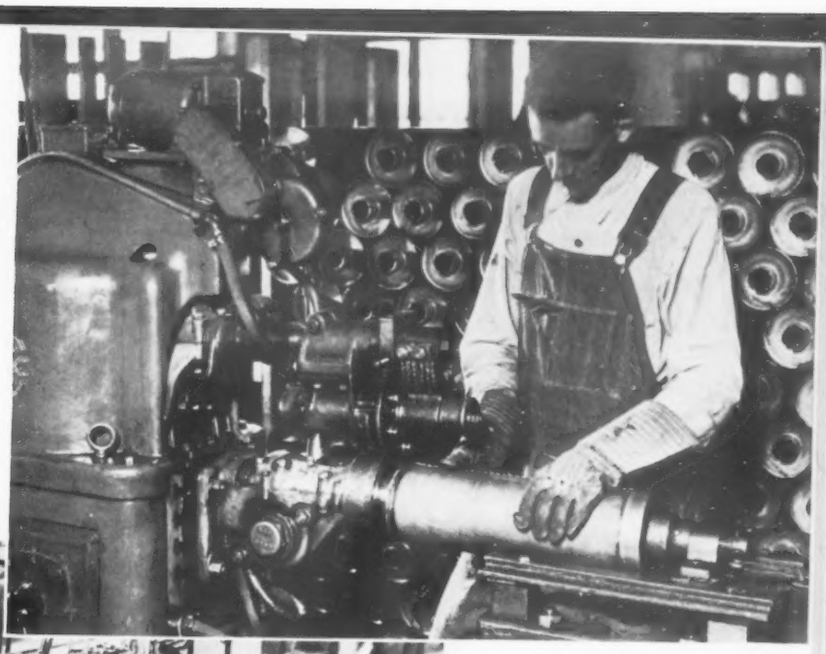
Practice followed by the Walker Mfg. Co., Racine, Wis., is to form all parts from flat-rolled steel and to assemble them securely by welding. The company manufacturers silencers and exhaust pipes to accommodate all makes of passenger and commercial cars.

Walker silencers are made in two types. The direct flow type comprises simply a patented louvered tube surrounded by an outer shell. Shape and spacing of the small louvers, which are located the entire length and circumference of the tube, cause the exhaust gas to swirl within the sound absorbing chamber before being ejected out the tail pipe. When dimensions of the vehicle necessitate the use of a short muffler, the tri-flow silencer is used. This type employs three louvered tubes instead of one and locates them so that the gases flow back and forth before leaving the muffler, thereby traversing as far as in the one-tube unit but in a more confined space.

The louvered inner tubes are made from 20-gage hot-rolled annealed sheets. The steel first is slit to the proper width that will give the desired tube diameter when the pieces are formed, and the small triangular-shaped louvers then are punched in the flat strips. This is performed on

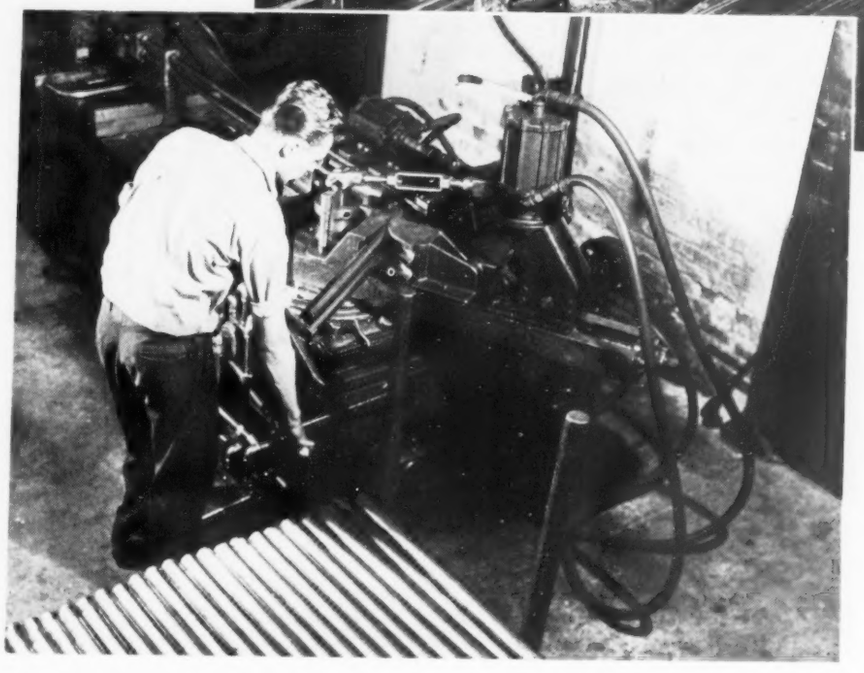
BY W. G. GUDE
Associate Editor, STEEL

and Welding Are Exhaust Mufflers



BELOW is shown the bending machine which shapes exhaust and tail pipes to fit the car, without distorting cross section of the pipe

ABOVE the operator is stitch welding heads to the outer shell of the muffler. At the left is shown a battery of machines which weld exhaust pipe tubing continuously as it emerges from the forming roll stands



a punch press. A section of the strip is punched, the piece is moved and the operation repeated until the entire length has been worked, as shown in one of the illustrations.

The strip then is cut into required lengths. These sections next are shaped into tubes by means of a Stolp forming machine. In this operation the flat pieces are placed in the machine, a horizontal bar descends and gives the material a half-circle bend. The piece then is drawn between rolls which complete the tubular formation, while the seam is being clinched at the same time.

Outer shells employ 22-gage hot-rolled, pickled and oiled steel sheets. Sections are cut to size and formed into tubular shape in a manner similar to that used for the inner tube. Heads located at each end of the muffler are stamped from 18-gage hot-rolled strip. This material must take a deep draw in order to form the necks of the head to which the exhaust and tail pipes are attached. Intermediate partitions of the muffler, one of which holds the louvered tube in place while the other directs the gas into the tube, are stamped from similar stock. These two pieces are located in the shell and spot welded in place.

In affixing the heads, the ends of the shell first are flanged on a horn press. The front and rear heads then are fastened by means of a single-head double sealing machine and are further secured by stitch welding on a machine which provides practically a continuous union throughout the circumference at each end. The mufflers finally are sprayed and moved by an automatic conveyor to the baking oven and on to the carton packer.

Heavier equipment is required to fabricate the exhaust and tail pipes which are attached to opposite ends of the silencer. A mill takes lengths of 18-gage cold-rolled strip having sheared edges and a skin roll temper

and forms them to tubular shape. As the pipe comes from the mill, it is fed into one of four automatic machines which butt weld the joint with a gas flame. The pipe then is passed through a series of rolls to strengthen it and round the outside surface.

Because of variations in dimensions of different automotive vehicles, the exhaust pipe must be bent to fit the particular make on which it is to be used. Some of these shapes are rather complicated and involve numerous bends. This work is accomplished on a bending machine which provides the correct contour without disturbing the circular cross-section of the pipe.

Sheet Metalworking Promoted as Hobby

SHEET metalworking as a hobby for young and old is being promoted by the Glascock Bros. Mfg. Co., Muncie, Ind., which has developed a complete line of metalworking equipment designed primarily for installation in homes. The company also has compiled two comprehensive books for the guidance of its customers. One is a sheet metalworkers' manual and the other is a book of designs of products to be made by sheet metalworkers.

The designs cover a great many products and articles such as hanging shelves, yard ornaments, window refrigerators, smoking stands, bird houses, oil bottle display stands, watering troughs, dust pans, and tables, bins, toys, ferneries, vegetable bins, hanging shelves, waste baskets, lamps, milk stools, milk bottle carriers, milk cans, pails, medicine cabinets, clothes line reels, cookie cutters, mail boxes and a great many others which may be made with the company's equipment.

Also for Commercial Use

These outfits also are offered to garages, body repair shops and tinsmiths, and to individuals who can use their full time or spare time for the production of these and many other products for sale.

Equipment manufactured by the company for such use includes a small electric spot welder for use on home circuits, a combination pan and box brake with accessories, a jig shear for cutting irregular shapes, a portable spray outfit with spray booth, a set of forming rolls, and other related units suitable for working with 18-gage and lighter sheets. These are offered singly or in complete outfits priced at all the way from $85 for a set of six units up to $200 for the complete combination of 15 units. Practically all of this equipment is of welded or riveted rolled steel construction.

Steel Manufacturers Issue Revised Specifications

The technical committees of the Association of American Steel Manufacturers has issued revisions of four of its standard specifications dealing with still tubes for refinery service and heat exchanger and condenser tubes.

These specifications are as follows: No. 100-35, "Seamless Low-Carbon Steel Still Tubes for Refinery Service;" No. 200-35, "Seamless Alloy Steel (4-6 Per Cent Chromium) Still Tubes for Refinery Service;" No. 300-35, "Seamless Cold-Drawn Steel Heat Exchanger and Condenser Tubes;" and No. 350-35, "Seamless Cold-Drawn Alloy Steel (4 to 6 Per Cent Chromium) Heat Exchanger and Condenser Tubes."

Copies of these specifications may be obtained from the association headquarters at 616 Investment building, Pittsburgh. T. Walley Williams, is recording secretary.

Metals and Plastics Exhibit Opens in New York

The first section of the Metal Products exhibit—the first permanent exhibition of metals and plastics in this country—opened its doors to visitors Sept. 16, in the International building, Rockefeller Center, New York. This exhibition, under the direction of Metal Products Exhibits Inc., is designed to provide a comprehensive review of metallic and plastic materials and parts used by industry.

Features at the opening of the exhibit include a display of "Metals in the Modern Manner," by a group of industrial designers; an exhibition showing metal finishing in all its phases; and a comprehensive display of modern plastics as parts and finished products.

The exhibition of modern metal finishes includes numerous examples of straight polishing, electroplating, chemical coloring, rustproofing, lacquering and enameling, and vitreous enameling. Among the manufacturers contributing to this exhibition are Aluminum Co. of America, Egyptian Lacquer Co., Grasselli Chemical Co., Hanson-Van Winkle-Munning Co., Lea Mfg. Co., Maas & Waldstein Co., Morris Sanders, Parker Rust Proof Co., Pyrene Mfg. Co., Philip Sievering Co., Udylite Co., and the Zapon Co.

Why not make sheet metalworking your hobby? The units shown include a small spot welder, forming equipment, spray booth and other accessories specially designed for use in the home or small shop

Overhead Material Handling Facilities Now Recognized as Production Tools

BY A. C. GARNETT
Secretary and Treasurer, Cleveland Crane & Engineering Co.
Wickliffe, O.

AMONG important recent developments in the steel producing and metalworking industries is a growing understanding of the production possibilities which come under the general head of overhead materials handling. To a large extent cranes and allied equipment have been viewed generally in the past as utility units. Their full usefulness as production units has been realized in certain highly specialized industries, such as the automotive field, but this conception of handling equipment now is spreading and must continue to spread more than ever into all industries.

Adding More Cranes

In numerous instances many plant engineers have shown a pronounced tendency to provide additional overhead handling facilities and eliminate delays entailed in "waiting on the crane." This is reflected not only in the new structures which are being erected to house continuous strip and other new mills, but also in the modernization of older buildings. We have had several cases lately where steel companies have placed an additional crane on a runway. In one such instance, two cranes on a runway could not adequately service the entire floor; a third crane has been placed on the runway, and a marked improvement in production has resulted.

Rod and wire mils are resorting increasingly to the use of such equipment as tramrail systems and cranes in order to speed up production and eliminate back-breaking work. Where it used to be necessary for a man to use superhuman strength to lift and move 150-pound bundles every few minutes, now that many mils have gone to heavier but more economical bundles of 400 pounds, with such equipment these are handled easily, quickly, and with no effort on the part of the operator. An interesting by-product of such installations is that they lighten the load so that skilled men who are becoming older, or somewhat incapacitated, can still carry on and thus lengthen their productive life to an appreciable extent.

Installation of overhead handling equipment never should be undertaken without a thorough engineering study which will fit it into the plant production line. When cranes and other handling equipment are treated in this way they make it possible to get full results from machinery and other production equipment. The opportunities for reducing operating costs with properly engineered handling equipment are boundless.

Foundry Uses 3-Level System

As an example, one large steel foundry has solved its handling problem by means of a 3-level overhead system. Over the molding pits are 2-ton, single-leg, tramrail gantry cranes. Above them are two 10-ton, single-leg, standard gantry cranes; while above these two levels is a 100-ton overhead traveling crane running the full length of the foundry. This plant has eliminated costly delays incidental to waiting for crane service, with consequent speeding up of production, and considerable saving in power consumption by the use of the lighter equipment for the light lifts.

Somewhat the same system has been engineered over the main assembling floor of a large machine tool manufacturer. Originally the entire floor was serviced by a single 50-ton crane, and much time was lost in waiting for service. Recently a number of single-leg, tramrail gantry cranes were added, one at each station. Each assembly man now has one of these cranes and can handle all except the heaviest lifts without calling for the overhead crane. With this layout, production per man has been increased and assembly costs reduced.

Many tramrail handling systems now being installed pay for themselves in three to six months because of the extent to which they reduce operating costs. Recently we made one installation which paid for itself in less than three months. This was an open-hearth charger of the overhead type, supported from an overhead tramrail crane. It is in use in a steel foundry which previously had been charging its furnaces by hand.

New Tools Demand Speed

The importance of overhead handling equipment and its future possibilities were emphasized in a striking way by the amazing new machine tools exhibited at the recent Machine Tool Show in Cleveland. With modern machines that can produce large numbers of finished parts per minute, to accuracies of 0.0001-inch, the problem of handling becomes of paramount importance. Success with these modern, high-production machine tools is absolutely impossible without facilities for moving raw material to the machine and removing finished parts at speeds synchronizing with the capacity of the machine. Many of the buyers of these machines will find that the overhead handling equipment, to which they previously have been accustomed, will not meet the new conditions. For, bear in mind that the improvements in overhead cranes and tramrail systems have kept pace with those in other types of machinery and equipment.

Modern overhead traveling cranes

have been improved by the use of better methods and materials. They are of all steel, arc-welded construction. They are designed for rigidity to maintain alignment necessary for use of antifriction bearings. They have higher bridge and hoisting speeds, and greater ease in handling. These features permit longer life with lower maintenance costs in heavy duty service.

Modern tramrail systems, with their many different types of trolleys and hoists, switches, turntables, transfer cranes, hair pin hook units and below-the-hook accessories, such as grabs, racks and buckets, offer unlimited possibilities to meet the simplest or the most elaborate materials handling requirement that can be found in any type of an industry, small or large.

Management will find it profitable to study the full possibilities of such equipment. By proper consideration of the production scheme in any plant, it generally is found that a wholesome condition is one in which the handling equipment pushes the production units, rather than have the production units wait on the handling equipment. With such a conception in mind, the profits to be obtained from investments in soundly engineered handling systems often may be enormous. In any event, the possibilities are such that no aggressive management may overlook them.

Gear Cutting Machines Designed To Meet Demands of Cost and Quality

BY W. F. SLOMER
General Sales Manager, Fellows Gear Shaper Co.
Springfield, Vt.

CAN a representative and progressive metalworking establishment afford *not* to buy machine tools of the latest design?

The answer of most manufacturers to this question in all probability would be emphatically "no," but there are many plants in which the economic justification for replacement of old machines must be studied carefully, and before new equipment is purchased the following points generally are thrashed out by production engineers:

Will the proposed new machinery increase production sufficiently to warrant the investment? Will a much better quality be possible?—and this is an important point. Will tool cost be enough lower to justify the investment, and will the new machinery result in a lower labor cost? The question of floor space which will be taken up by the new equipment must be considered, also, will the power consumed be less than on the older type machines? With modern machine tools, the answers to these questions is in most cases "yes." All the foregoing points are in favor of new equipment.

Flexibility Is Important

Another point weighed by engineers today is: "Are the proposed new machines universal so that at slight cost they can be changed to produce a different type of work from that for which they were originally purchased? At the present time, because of the constant changes in products, this is indeed pertinent. It is the writer's opinion that no concern is justified in purchasing expensive machine tools for any particular operation without knowing definitely that they can be converted to the manufacture of new products.

Furthermore, the question must always be kept in mind that with prices being reduced constantly, cost also must be reduced, and with competition extremely keen, quality must be improved. In the writer's mind, these two objectives can be obtained best by installation of up-to-date equipment.

Noisy Gears Taboo

In our particular field, gear cutting, quality and quantity are necessary requirements of manufacturing equipment. As gear noises cannot be tolerated today, it is extremely important to use the right type of equipment so that excessive scrap and tear-downs resulting from noisy gears can be eliminated. We have studied the gear situation carefully and believe that to obtain high-quality gears at low cost, complete control of the gear cutting and subsequent operations must be watched closely.

By elimination of heavy moving parts in the gear cutting machines which we build, we reduce tool cost considerably and produce high-quality gears at one-third the cost with old equipment. Particular attention is paid to the insertion and removal of work from machines so that there is little nonproductive time. The machines are so arranged that they can be bolted together and thus effect a great saving in floor space, also enabling an operator to serve more machines than he otherwise could if the units were separated.

Efficient inspection devices must be provided to insure gear quality; therefore, we manufacture a complete line of inspection equipment for gears and for the tools used in cutting gears.

A specially-designed machine for sharpening cutters always insures the cutter being sharpened correctly and capable of producing high-quality gears. This machine is 300 per cent more efficient than the old methods of sharpening cutting tools with fixtures on standard grinding machines.

A problem often lost sight of is the excessive upkeep of old machines. A careful study should be made of the cost of repairing these obsolete machines to produce the class of work which is necessary today. In many cases, accurate cost records would prove startling and would favor the the purchase of new equipment to replace the old.

Lapping Corrects Inaccuracies

The machine tool manufacturer has contributed largely to better quality products by the introduction of machine tools which have never previously been used—for example, the lapping machine designed for lapping spur and helical gears after heat treatment. This particular machine probably has done more to produce quiet gears than any recent development, as it corrects the slight inaccuracies which result from the heat treating process and corrects tooth profiles, spacing, lead errors and eccentricity, and imparts smooth rolling action to the hardened teeth.

The writer is impelled to comment upon how much the automotive industry has contributed to the machine tool industry, because the automotive industry, being highly competitive, has forced machine tool manufacturers to produce tools which would cut costs radically and at the same time improve quality.

Where cost and quality are of vital importance, manufacturers of metal products *must* equip their plants with up-to-date machine tool equipment.

Limitations of Deoxidizer

The new deoxidizer and antipiping compound announced by Niagara Falls Smelting & Refining Corp., Buffalo, is recommended for use in iron castings weighing 400 pounds or more, or having wall diameter of 2 inches or more. It may be used satisfactorily in all steel castings. It was stated erroneously in STEEL of Oct. 7, page 33, that the new deoxidizer was recommended only for castings having heads and risers 12 inches or more in diameter.

POWER DRIVES

Roller Chain Lubrication

WHEN roller transmission chain is not enclosed in an oil-tight chain case and splash or drip lubricated most transmission engineers recommend removing the chain periodically and giving it a thorough cleaning before relubricating and replacing in service. This is necessary because dust becomes oil soaked and hardens at the openings around the roller joints and prevents the lubricant entering into the joint where it is most needed.

One of the best methods of cleaning chain is to remove it and place it in a bath of kerosene or gasoline to loosen the encrusted dirt. Kerosene is more penetrating but some transmission engineers prefer gasoline because it does not leave a film, like kerosene does, which dilutes the new lubricant. This kerosene film may be removed by a dip in gasoline, however.

The cleaned chain is relubricated by immersing in a bath of heavy oil or grease which has been heated sufficiently to permit it to flow into the joints as the chain is flexed while submerged.

Where the chain is not removed and cleaned before relubricating a light grade of oil stands a better chance of entering the roller joints than a heavy lubricant which would coat the surface of the chain and sprockets where lubrication is not so necessary as around the roller joints.

In some cases transmission engineers prefer to lubricate the chains as much as possible without removing them, thus balancing the shorter chain life against the decreased maintenance expense. For such purposes some manufacturers of lubricants produce special penetrating greases which stick to the chain and enter the roller joints after softening the old caked lubricant at the openings.

Wherever roller chains operate at high or even moderate speeds it is usually advisable to enclose them and to provide splash or drip lubrication.

• • •

Welcome the Salesman

The better salesman of transmission equipment has more of a mission than to ask the question "What do you want today?" and quote prices. He is an authority on his products. His knowledge and recommendations, backed by a quality product, are a sales combination hard to beat. The wise plant man will find it profitable to cultivate his acquaintance.

From the transmission salesman's standpoint this practical information is a part of his stock in trade. His reward, however, largely depends upon how many calls he can make. The plant man can help by seeing his caller as quickly as possible or, when tied up in an emergency and receiving callers is impossible, to impart this information to the reception room so that none shall wait needlessly.

Salesmen state that transmission and maintenance engineers are two of the most difficult plant men to see because they roam the whole plant and when not in their offices are hard to locate.

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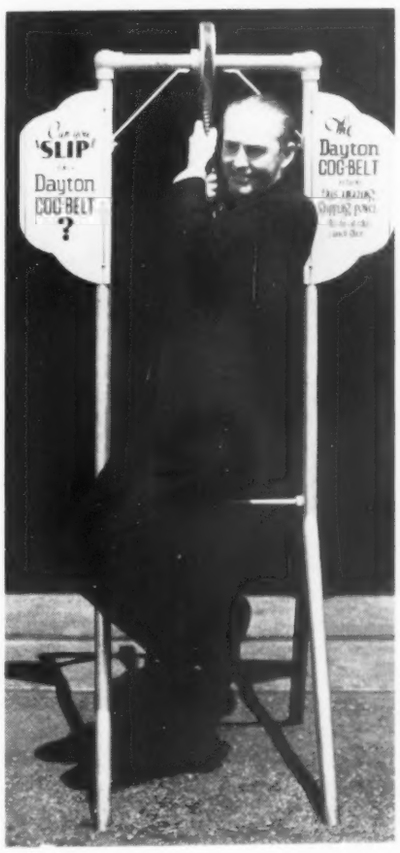
Grips Pulley



Anti-slip properties of its Cog-belt are demonstrated on this device by the Dayton Rubber Mfg. Co., Dayton, O. From one end of a belt hung over a grooved pulley a man may suspend his weight without any slippage; the greater the pull, the more tightly the belt wedges itself into the groove

Lineshaft Alignment

Even with the best of care lineshafting may get out of alignment due to loosened bolts, settling of the building, loading or unloading the floor above or other causes. Such misalignment, even with the most efficient hanger bearings, increases the power consumption and throws an excessive overload on the motor when starting.

One plant has adopted the plan of checking shaft alignment once every two years; one-half of the shafts are checked each year. All belts are thrown off and alignment is checked by the use of a surveyor's level and a target which is hooked over the shaft. This provides a quick and very accurate check.

Another good practice is to check for loose hanger bearing bolts about a month after any new lineshaft is installed or realigned.

• • •

No Loose Pulley Trouble

Loose pulleys are an abomination unto the plant maintenance engineer. At least they always have been until pulleys with antifriction bearings were available. One large midwestern concern with a number of plants uses the loose pulley on the countershaft as provided with new equipment until it causes trouble from wear and then installs a new loose pulley with antifriction bearings instead of trying to fix it up.

Where all but a few overhead bearings are of the antifriction type, and so require only periodic attention, these few that need daily, or more frequent service, are a nuisance. Loose pulleys with antifriction bearings could well be standard equipment on all countershafts as supplied by machine manufacturers.

• • •

Drives should be engineered as thoroughly and carefully as the machines they operate, because no machine can operate to best advantage if its drive fails to deliver.

• • •

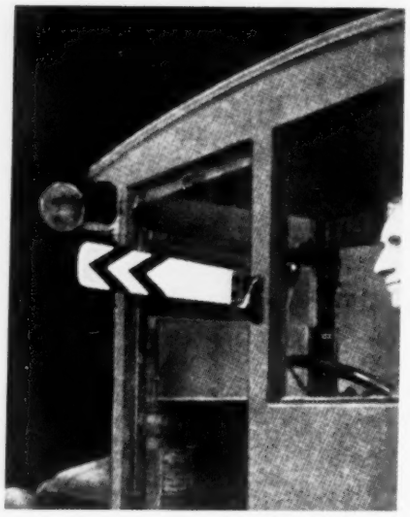
Whenever equipment is operated in a confined space, bearings may "carry a temperature," due to insufficient radiation, especially if the shaft is driven at high speed.

LARGE USES OF STEEL IN SMALL WAYS

297th Article ◆ Truck Signals

TRUCK signals, because of their value in reducing the hazards of travel on public highways, have come into wide use. State laws require drivers of vehicles to signal before a turn is made. Whereas the automobile driver in nearly all cases makes hand signals, it is advisable to provide the driver of the heavier truck with a mechanical aid. This takes the form of a semaphore which swings into position with the pulling of a lever and stays there, leaving both of the driver's hands free to operate the steering wheel and the gear shift. A lock prevents it from falling except when the operator releases the handle.

Such signals have a good many talking points. They help truck owners to enjoy lower insurance rates by reducing the number of accidents. They prevent losses not covered by insurance. They minimize the idle time of vehicle and driver, reduce damaged shipments, prevent loss of business because of nondelivery, save lives and litigation.



—Villard Signal Mfg. Co., Rochester, N. Y.

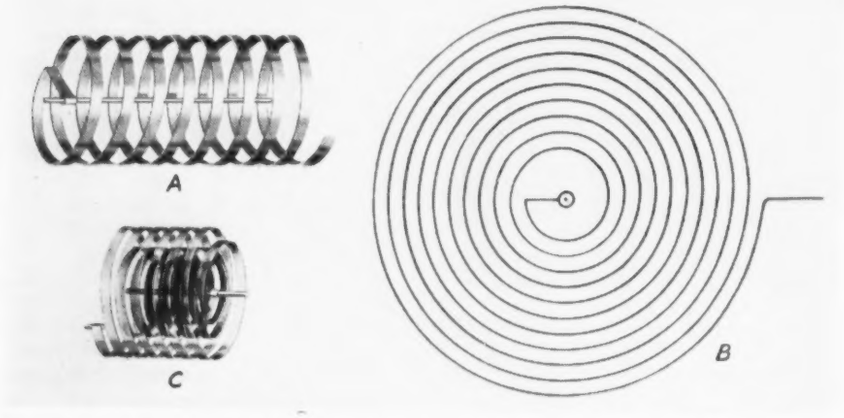
Numerous small steel parts enter into construction of semaphore signals, now in use on thousands of motor trucks

Supported on Steel Frame

In the construction of such signal units, considerable steel in the aggregate is consumed. One well known make of signal which has been approved in all states is shown in the accompanying illustration. While the semaphore is of bass wood and the operative handle knob of maple, practically the remainder is of steel.

The semaphore support or hinge is of 14-gage autobody steel, fastened by $\frac{5}{8}$ x 11-inch iron escutcheon pins. The signal case is of autobody sheet steel and the signal assembly is by means of tubular and solid steel rivets. The signal is attached to the truck with iron-head woodscrews. The handle on which the maple knob is placed is a $\frac{3}{8}$ x $\frac{1}{8}$-inch piece of cold-rolled strip steel. The operating means between the handle and the semaphore is of $\frac{3}{8}$-inch diameter cold-rolled steel and of No. 8 coppered steel sash chain. The flexible joint on the semaphore is operated by $\frac{1}{4}$-inch rubber conveyor belting.

The truck signal shown will fit all types of trucks, of any make or model. Wide bodied trucks are fitted by using extension rods and brackets. The type shown is currently in use on thousands of trucks.



Three bimetal thermometer elements designed to provide same deflection and torque are shown in proportionate size. A is the straight helix, B the spiral, while C shows the new Rotothern form. Actual diameter of coils A and C is 0.32-inch

New Thermometer Principle Devised

A NEW principle of thermometer construction, said to remove many previous limitations to accuracy and durability of temperature indicating and control devices, has recently been developed in Europe and will soon be introduced in this country. Making use of bimetal strip which deflects in proportion to temperature change, the principle involves a unique method of winding the strip into a unit of concentric helical coils, so that the forces of deflection are additive, but the forces tending to cause distortion and friction are mutually counterbalanced within the coils.

Using the new form of coil, it is possible to construct rugged all-metal thermometers with an accuracy equal to or exceeding that of the ordinary spirit or mercury type, according to tests made in the laboratories of the German College of Science and Technology, Prague. Tiny thermal elements less than $\frac{1}{4}$-inch in length, or large elements with sufficient torque to move a pointer 6 or more feet in length can be constructed with the same general form of coil. Deflection sufficient to space out a narrow temperature range over a 360-degree circular scale is said to be obtained without encountering loss of accuracy.

Wound Into Helix

The new form of coil was first proposed as a result of mathematical analysis by Franz G. Bloch several years ago. Because the degree to which bimetal strip bends when subjected to a slight temperature change is so small in proportion to its length, the strip is usually wound in the form of a spiral or helix to provide sufficient length to operate a pointer over a legible scale. Bloch found, however, that both spirals and helices lack the necessary rigidity to give a true angular deflection when the coil weight and the necessary turning force are considered. Moreover, increasing the thickness or width of the strip to give the rigidity required decreases the deflection and leads to distortion because of cross-bending across the width of the strip.

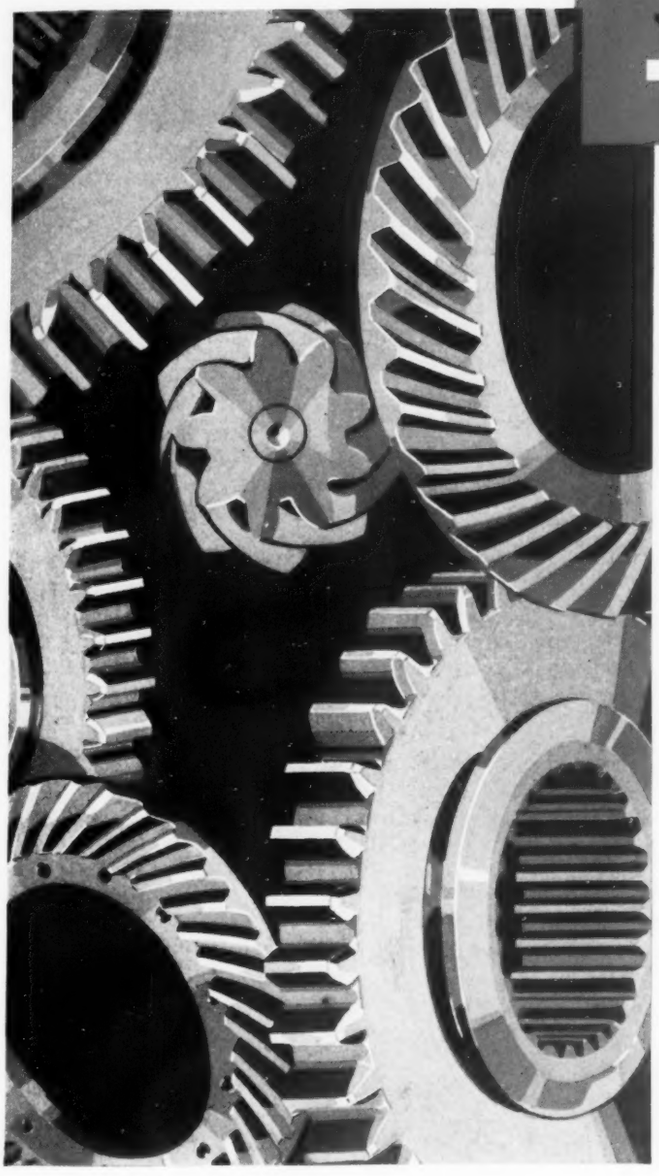
A coil consisting of concentric helices—in reality "coils within coils" in which all the forces except that which causes angular deflection

(*Please turn to Page* 57)

If you make or buy Gears . . .

HERE IS A STEEL THAT WILL REDUCE YOUR COSTS

3100



Republic's Improved Series of 3100 Steels was developed to enable gear makers and users of gears to reduce their costs without sacrifice of quality. » » » In analyses, these Improved 3100 Steels conform to standard S.A.E. compositions. But, they are finer grained and are made to new methods of metallurgical control. They develop a tough core and a good case. Made to new standards of hardenability, they can be carburized and quenched from the pot with a minimum of distortion. They are readily conditioned for machining. » » » Republic's Improved 3100 Steels give the gear maker and the gear user everything they are now getting from higher-priced, longer-established alloys. Write for data. » » » » »

REPUBLIC STEEL

Republic Steel CORPORATION

ALLOY STEEL DIVISION, MASSILLON, OHIO
GENERAL OFFICES: YOUNGSTOWN, OHIO

METHODS AND MATERIALS

Carbon Steel for Shock Loads

A GREAT many factors must be considered in selecting a steel for any given purpose, but so far as resistance to shock loads is concerned carbon steel makes a better showing than some alloy steels, according to the national bureau of standards, Washington.

Information on the relative resistance to shock loads of carbon steel and of an alloy steel proposed for the construction of large chains for lifting the gates of a dam in the Mississippi river was recently requested of the bureau.

The most convincing way of obtaining such information would be to subject chains of the two types of steel to shock loads and observe their behavior. Such tests were not practicable, however, since the chains were designed to have a lifting capacity of 1,000,000 pounds.

It is known that carbon and some alloy steels, when fractured by a sudden application of load will, under certain conditions, show a fibrous fracture, says the bureau, whereas under other conditions the fracture will be granular and be produced by a considerably smaller shock load.

The transition from a fibrous to granular fracture may occur with a temperature drop of the order of 100 to 0 degrees Fahr. Other contributing factors are change in size, form, composition and previous mechanical and thermal treatment. Some of these factors may cause the transition to occur at a higher temperature and some at a lower one.

For a structure exposed to atmospheric ranges of temperature, the lower the temperature at which the transition from fibrous to granular fracture of the material occurs, the greater the margin of safety to be expected under shock loads.

Charpy impact tests made on notched bar specimens of the steels under consideration for the chains at various temperatures ranging from 40 to 212 degrees Fahr. showed that the transition from fibrous to granular fracture occurred at an appreciably lower temperature in the carbon steel than in the alloy steel. Therefore, to the extent that the relative shock resistance of the carbon steel and the tested alloy steel chains can be judged from the results, the tests indicated a greater margin of safty for the carbon steel, says the bureau.

\$ \$ \$

Develops Method To Cast Steel Chain Centrifugally

A recent patent describes a method for casting steel chain centrifugally. The links are formed in dry sand cores which are located at the outside of a motor-driven turntable. Just inside the link cores is located the metal channel with short gates to each link cavity, and the metal channel in turn is connected by radial gates or arms to a central pouring basin. Claims are made that the chains obtained are solid and dense. By the process, individual links, shots of chain using precast links, alternately, or shots of chain without use of precast links may be produced.

\$ \$ \$

Hard Faced Punch Lasts Longer

THIS HARD-FACED PUNCH, FOR HOT PUNCHING JAW SLOTS IN WRENCHES, has an average life per grind of 7800 pieces as compared with 600 pieces for a plain steel punch. The slug in the illustration is of 0.80 per cent carbon steel, is punched out of ¾-inch stock. The punch is faced with cobalt-chromium-tungsten alloy. Photo courtesy Haynes Stellite Co.

New Rod for Welding 18-8 Chromium-Nickel Stainless

A new stainless steel welding rod for welding alloy steels of the 18-8, chromium-nickel type is announced by the Linde Air Products Co., 30 East Forty-second street, New York. It is known as Oxweld No. 28, columbium treated, 18-8 welding rod and is covered by a patent application. It simplifies the fabrication of products from stainless steel of the 18-8 type and greatly improves the corrosion resistance of the fabricated joint areas.

The unique feature of this rod is

HE "DRIVES" BARS THROUGH THE MILL AT HALF A MILE PER MINUTE

No operator, no matter how skilled, could "drive" bars at half a mile per minute through a mill of less modern design, and deliver a finished product welcoming any inspection or comparison. But with the best available equipment responsive to his touch, the operator of the Inland Mill is able to combine dazzling speed with highest quality—to accomplish this with an ease which amazes the average observer.

INLAND DARES TO PIONEER

Before the Inland 10" Merchant Bar Mill was completed in 1930, it was thought that such a mill would not be practical for rolling the full range of sizes and shapes required . . . that high quality and accuracy could not be maintained with a mill having all roll stands in a straight line. • The promised efficiency of the straight line idea appealed to Inland executives. They contributed from their own experiences. Result . . . the fastest mill in the World producing a wide range of small bars. Ask Inland customers about quality . . . the accuracy and finish of Inland Merchant Bars. • Inland always dares to accept an idea promising a better product more efficiently produced. INLAND STEEL CO., 38 So. Dearborn Street, Chicago, Illinois.

the DRIVE . . . that's GENERAL ELECTRIC

THE fact that the Inland Steel Company selected General Electric main drive for this mill — the fastest mill of its kind in the world—is a tribute to the efficiency, dependability, and economy of G-E steel-mill equipment. Even in this mill, where bar speeds reach one-half mile a minute, General Electric motors, motor-generators, control, and switchgear operate smoothly and safely to produce a high-quality product at unprecedented speed.

When main- or auxiliary-drive problems arise, experienced engineers, specialists in steel-mill applications, in the nearest G-E sales office will be glad to consult with you. General Electric Company, Schenectady, N. Y.

008-21

GENERAL ELECTRIC

the inclusion of a definite quantity of columbium. Because of this feature, products fabricated from treated or stabilized 18-8 stainless steel by welding with this new rod have full corrosion resistance and heat resistance in the as-welded condition. No heat treatment after welding is necessary.

Because of the resulting economies and improved welds, says the Linde company, the use of this rod greatly extends the posibilities for oxyacetylene welding in the fabrication of 18-8 stainless steel. This applies particularly to fabricated structures to be subjected to high pressures. Technique required with the new rods is the same as that usually employed in welding stainless steel.

* * *

Stops Enamel Blistering

In porcelain enameling a short cast iron leg which had two very thin sections, an enamel plant encountered difficulty with blistering. Notable improvement was obtained by moving the molding floor closer to the cupola and pouring the molds when the iron was hottest. The trouble did not disappear entirely, however, until changes were made in the pattern.

Suspended Monorail System Suggested For Rapid Transit in Congested Center

WHAT may be the first important practical application of suspended monorail to mass high speed passenger transportation in this country is being given serious consideration in connection with a proposed development in Queens, New York City. The system discussed is a 5-mile double track installation for the Rockaway peninsula on the Long Island railroad right-of-way, from Rockaway Park to Far Rockaway.

Definite engineering studies for this particular location have not been completed, but from present estimates it appears that at least 15,000 tons of steel would be required, in addition to the amount necessary for equipment, stations and other accessories. An engineer's conception of a section of the contemplated installation is shown herewith.

The structure for the proposed double track system, which it is claimed would have a capacity equal to that of a double track elevated railroad, would be borne by a series of T-shapes towers, 30 feet high, three feet wide at the base and placed about 50 feet apart. These towers may be made ornamental and would be no more objectionable in appearance than a row of electric light poles and would form no more of a barrier.

The structure supported by the T-shaped towers would consist of two continuous, 30-inch I-beams connected together with light bracing rods to give rigidity. There would be no ties or road bed between the rails. Whether the monorail structure would be welded or riveted has not been decided, pending final settlement of the details of the design for this particular installation. Both methods, however, have been carefully studied in their general application to this type of system.

It is proposed to run light-weight, streamlined trains having composite wheels and so designed that all running parts will be sound-proofed. The suspended trains would have about 15 feet clearance between the car bottoms and the street level, as the illustration shows.

Many advantages are claimed for the suspended monorail type of speed transportation, which is similar in principle to one employed successfully in Germany for many years. Frank S. Lyon, president of the Atlantic Suspended Monorail Corp., 67 Wall street, New York, active in conferences on the proposed installation, emphasizes primarily safety, speed and maximum riding comfort and points out that first costs, as well as operating and maintenance costs, are less than for elevated railways and subways.

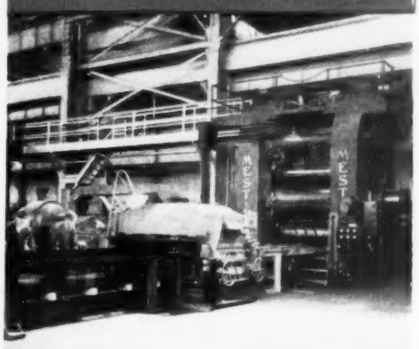
An important factor in the cheaper installation cost is the reduction in weights of equipment and the line itself. Engineering analysis, he declares, shows that the weight of the suspended monorail train, including car bodies, trucks, brake rigging and other mechanical details, is from 20 to 30 per cent less than the weight of a corresponding train used in elevated railway service. This reduction in weight is possible largely because of the design of a truck running on a single rail.

Mechanical Details Simpler

Cost of the steel structure for a suspended monorail line is less because the weight of the equipment is less, the stresses lighter and mechanical details simpler, it is said. The single stringer needed for a monorail train weighs from 15 to 25 per cent less than the two stringers required to support the same load in a 2-rail system. Saving in maintenance and operating costs is said to be substantial, due in no small measure to reduced wear and reduced current consumption resulting from operation of lighter equipment.

Other advantages claimed include quiet operation; no depreciation of real estate values; more rapid construction as compared with elevated railway, and still much more as com-

Proposed 5-mile double-track, suspended monorail, rapid transit system for borough of Queens, New York City, would require at least 15,000 tons of steel, not including requirements for equipment, stations and accessories



Again

YOUNGSTOWN

ANTICIPATES THE CHANGING NEEDS OF INDUSTRY

With its new wide continuous cold mill in operation, Youngstown is in position to meet the modern demand for flat rolled steel of greater width.

Inquiries are invited for the following sizes and gauges

SHEETS—

28 gauge and heavier; widths 24 to 90 inches inclusive. In either coils or cut lengths depending upon gauge and size.

STRIP—

.015 and heavier; widths 9 to 23 15/16 inches inclusive. In either coils or cut length.

THE YOUNGSTOWN SHEET AND TUBE CO.
Manufacturers of Carbon and Alloy Steels
General Offices - - YOUNGSTOWN, OHIO

555

YOUNGSTOWN

pared with subways; and no interference with, or by, traffic. According to John J. Halleran, commissioner of public works, borough of Queens, the system would eliminate at the lowest possible cost 40 grade crossings now existing in the Rockaways.

Commissioner Halleran declares that the transit committee of the Queens planning commission has approved suspended monorail after studying it from the engineering, transportation and architectural standpoints. B. Waller Duncan, president of the Manhattan & Queens Traction Co., is quoted as saying that he had inspected and studied the German suspended monorail line and that he considered the system entirely practical from an operating standpoint.

Steel Alloys and Alloy Practice Are Covered Comprehensively in Handbook

A SCIENTIFIC treatise dealing with various kinds of alloys and their uses, and containing numerous tables, charts and illustrations has been published by the Bethlehem Steel Co., Bethlehem, Pa., in the form of a 375-page leather-bound book. Entitled "Bethlehem Alloy Steels," the book is of so comprehensive a character as to place it on the plane of a handbook on alloys and alloy practice. It is priced at $1 per copy.

Part 1 lists the S. A. E. grades, alloy and special purpose carbon, special carbon, medium manganese, nickel, nickel-chromium, molybdenum, chromium, vanadium and silicomanganese steels. Part 2 covers steels for specific uses including carburizing and nitriding steels and steels for elevated temperatures. This section also covers bearing, magnet, alloy gear, railroad, spring, airplane and oil industry steels. It also covers steels for tools and machine parts.

Testing and properties of steels are covered in Part 3. This includes chapters on grain size, P-F test, effect of cold drawing on tensile properties, effect of size of test bar, effect of mass on properties of heat treated steel, endurance strength of steel, deflection of steel under stress, steel at low temperatures, iron-carbon diagram, chemistry composition hardness, hot acid etching, tension test terms and units used in the measurement of permanent magnets.

Extensive Charts and Tables

Part 4 covers the working of steel, including quenching media, pyrometers, liquid heating baths, color charts, heating of steel and refractories. Part 5 covers definitions of terms used in the steel industry. Part 6 includes tables and useful information such as weights and areas of square and round bars and other sections, area and circumference of circles, weights and specific gravities, conversion tables, functions of numbers and much other information of value to users of alloy steels.

Press shop at the Briggs Mfg. Co., Detroit, illuminated by 150 high-intensity 400-watt mercury vapor lamps in open, deep-bowl reflectors, mounted 40 feet above the floor and supplying 22 foot-candles at operator's level

Progress Made in Industrial Lighting

IN LESS than two years, vapor illuminants, notably the sodium vapor and the high-intensity mercury vapor lamps, have passed from the experimental stage into the class of practical, efficient sources of artificial light. Prior to November, 1933, when the first commercial installation of sodium vapor lamps to be sold in this country was put into service along a new highway in Port Jervis, N. Y., vapor illuminants were more or less of a laboratory plaything, indeed an adolescent light source needing operating facts to give it the aspect of maturity.

In the opinion of Oscar P. Cleaver, illuminating engineer, Westinghouse Lamp Co., Bloomfield, N. J., who reviewed to date the progress of vapor lighting before the recent annual convention of the Illuminating Engineering society in Cincinnati, this new tool of the lighting engineer is destined to enjoy a tremendous use in the coming years.

Suitable for Yard Lighting

In addition to its wide adaptability for highways, the sodium vapor lamp possesses possibilities for outdoor lighting purposes of an industrial nature. Factory and industrial yards, outdoor construction and other diversified working areas lend themselves to the successful use of this light.

The objection to the color of sodium light is not so great with the high intensity mercury vapor lamp, which operates with equal efficiency and effectiveness, according to Mr. Cleaver. Its bluish-green color of light is not so objectionable from the standpoint of appearance and thus does it find ready application in plant interiors where a high intensity light is desirable.

Among the uses of the mercury vapor lamp are those for the street and bridge lighting; photographic work; store, office, and plant lighting; and numerous phases of floodlighting as in construction work and for buildings and business places, such as filling stations. Industrial lighting installations include the Philco plant at Camden, N. J.; the Briggs Mfg. Co., Detroit, and in other body and auto plants.

Steel Constructors Name Speakers for Convention

American Institute of Steel Construction announces the program for its thirteenth annual convention to be held at the Greenbrier, White Sulphur Springs, W. Va., Oct. 16-18. Among the features are seven addresses and a symposium.

The last day of the convention will be given over to discussions of the bid depositary, cost estimating formula and other internal problems. This will be under the direct charge of Robert T. Brooks, recently appointed executive vice president of the institute. A banquet will be served on Thursday evening, Oct. 17, and the usual get-together dinner is scheduled for Friday evening following the last of the business sessions.

Speakers and their subjects have been announced as follows:

"Opportunities for Steel," by E. L. Shaner, editor, STEEL, Cleveland.

"Possibilities from Co-operation," by R. B. Thomas, attorney, New York.

"What's Going On?" by Alexander Wall, Robert Morris Associates, Lansdowne, Pa.

"Government's Aid to Housing," by Albert C. Shire, chief engineer, technical division, federal housing administration, Washington.

"Steel Dam," by Dr. O. E. Hovey, consulting engineer, New York.

"Symposium on Fireproofing." K. E. Vogel, chairman. Speakers: Dr. S. H. Inberg, chief, fire resistance section, national bureau of standards, Washington; and Dr. J. H. Young, vice president, H. H. Robertson Co., Pittsburgh.

"Rigid Frame Bridge Tests," by Prof. H. L. Whittemore, chief, engineering mechanics section, national bureau of standards, Washington.

"Control of Welding in the Fabricating Industry," by Robert E. Kinkead, consulting engineer, Cleveland.

Offers Series of Welding Courses in Cleveland

A special course in arc welding design and practice for engineers, production managers, welding supervisors and foreman is being sponsored in Cleveland by the Lincoln Electric Co. in co-operation with the John Huntington Polytechnic institute. The course comprises five days of intensive training on arc welding generators, weld metal, weld inspection, stress distribution, ferrous and nonferrous metal welding and welding department, with all of the subjects supplemented with actual demonstrations.

The first course was conducted during the week of Sept. 23. It will be repeated for five-day periods on Mondays beginning Oct. 28, Dec. 2, Jan. 13, Feb. 17, March 16, April 13 and May 11.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Protect Working Capital

IN YOUNGSTOWN, O., recently we witnessed a performance in connection with welding structural steel that was pitiful. A steel fabricator had hired a welding shop with a portable engine driven unit to do a job. The welding shop had new and up-to-date welding equipment. The welding rod they used was suitable for the work. Yet the design of the welded connection was such as to make it doubtful as to whether the connection would stand up long in service.

The addition of 10 per cent more weld metal at the right place would have made the job safe beyond any question. Yet the fabricator and welding shop both had financial responsibilities for the job which, in case of failure, would become heavy.

Had the job been riveted, the American Institute of Steel Construction standards would have been applied as a matter of course. But being a welding job, the judgment of Jack-the-welder was all that stood between the contractors and a heavy loss. The fabricators, by standardizing welded connections, can accomplish two important results: First, control the welding in their own industry and keep the competitors in other industries from getting it; second, protect their working capital from losses due to weld failures.

Seeing Inside

The Naval Gun Factory at Washington examines steel castings with the X-ray. Defects are cut out, welded and again X-rayed to see that the weld is sound. Commercially, certain aluminum castings and other alloy castings which have a high cost per pound are subjected to X-ray examination. Welds in boiler drums and certain other pressure vessels are inspected by X-ray. Making a picture of the inside of a piece of metal is becoming everyday commercial practice. By use of optical science it is now possible to see the interior of a piece of metal in the same way that one can see the interior of a block of ice.

Sparks and Flashes

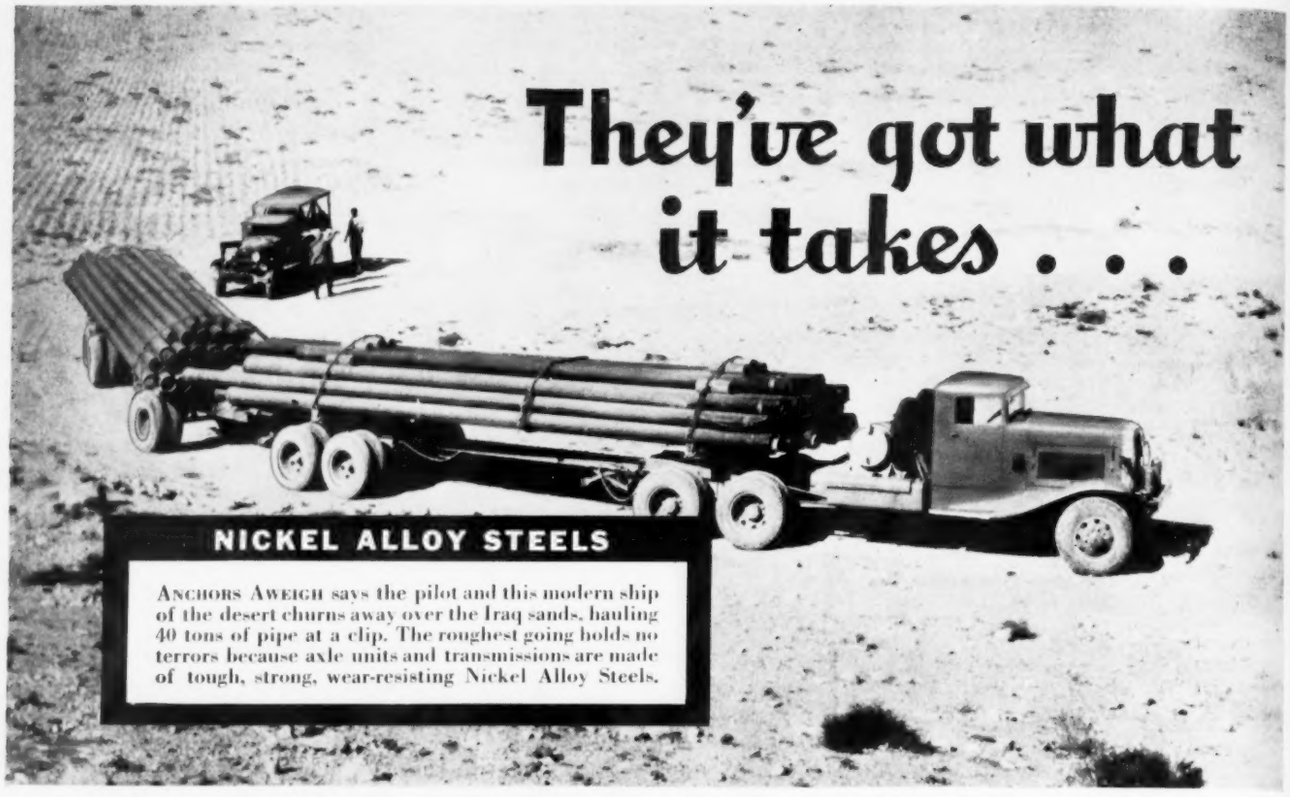
A large motor car manufacturer is reported to be carrying over 100 different specification of welding rod in toolrooms. The situation with reference to welding the new metals and alloys is rapidly getting out of control because of the rapidity with which new products are being brought out. It is well to remember that we can weld any metal we can melt but that all the original properties of the metal do not remain in the weld. In fact, the metal may be useless after it is welded.

* * *

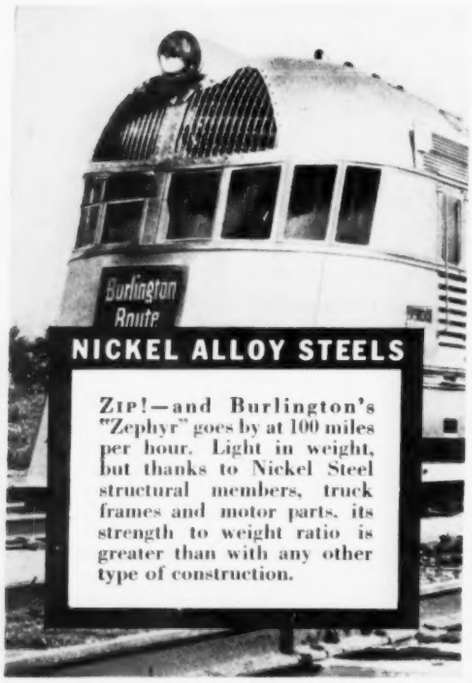
Billets, slabs and ingots may be welded together end to end, side to side, or flat to flat. And this is just one more headache for the steel producer. The men in the welding industry, and there are a number of good ones, are offering the steel industry ideas for cutting costs aud making improvements faster than they can be adopted. In some cases it means scrapping of equipment that is as good as new, but obsolete; and that gives any steel producer a headache.

* * *

Structural steel and steel plate fabricators are showing a greater disposition to order steel shipped direct from the mill and erect in the field with gas cutting and electric welding. In the erection of large tanks, small bridges, and one or two-story industrial buildings, the movement of steel direct from mill to the job often saves a good deal of money.


They've got what it takes . . .
NICKEL ALLOY STEELS
ANCHORS AWEIGH says the pilot and this modern ship of the desert churns away over the Iraq sands, hauling 40 tons of pipe at a clip. The roughest going holds no terrors because axle units and transmissions are made of tough, strong, wear-resisting Nickel Alloy Steels.

to win against STRESSES and WEAR!


Burlington Route
NICKEL ALLOY STEELS
ZIP!—and Burlington's "Zephyr" goes by at 100 miles per hour. Light in weight, but thanks to Nickel Steel structural members, truck frames and motor parts, its strength to weight ratio is greater than with any other type of construction.

NEW YORK
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NICKEL CAST IRONS
STOPPING the mammoth wheels of the modern bus hundreds of times a day, calls for brake drum material of superior mechanical properties. Hard, tough, wear-resisting Nickel Cast Irons are preferred for this punishing job because they not only provide dependable braking control but give long and low-cost service.

FREE! Send for our handy celluloid vest pocket size, "Hardness Conversion Table." Quickly gives approximate relation between Brinell, Rockwell and Shore hardness values and corresponding strengths of Nickel Alloy Steels. Address Dept. P1.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

Discusses Aluminum Addition In Present-Day Steels

IN VIEW of the low opinion once held by steelmakers and users alike of the use of aluminum in making steel, it is time for a presentation of the true status of this important element in steelmaking. It would be closer to truth, probably, in discussing the opinion of aluminum formerly held, to restrict the low opinion to the steel user and exclude in most cases the steelmaker.

It was originally believed, and probably is true, that aluminum was first used as a corrective for over-oxidized heats, and was frowned on as being a means for getting by with poor furnace practice. In view of the present widely used, although rather carefully concealed practice of adding aluminum to control hardenability, grain size, etc., and particularly the combination of aluminum addition with greatly improved knowledge and control of the basic open-hearth furnace itself, the status of this element has completely changed in recent years. This change is of course important to user and maker of steel alike.

Influence of Grain Size

Much has been written on the variation in properties of various heats of steel of approximately the same analysis as generally analyzed. Much has been written on effect of grain size, normality, etc., on the characteristics of the finished part. Grain size specification or understandings have become almost universal, especially in the automotive steels and not always with the best of judgment. Some prominent metallurgists have changed from open scorners of grain size specifications to become ardent advocates. Normalizing and annealing cycles are predicated on grain size specifications. Machining results have governed in many cases the grain size specifications—and so has distortion in quenching, impact requirements, fracture requirements, etc.

In most cases it has been found that the extremely fine grain, very abnormal types have definite advantages when combined with sufficiently high carbon, manganese and other alloys to insure satisfactory quenching. While this is being given considerable publicity at present, advantages of the extremely fine grained type was early recognized by those closely connected with the application of heat treated alloy steel and the carbon-manganese types.

Grain size specifications have become so common as to be considered in this country a natural requirement where steelmaking practice is to a large extent governed by the customer's requirements for a given part, rather than by chemical analys's and soundness tests.

This revolution has been one not only of open-hearth operation, but also in viewpoint and policy of the management and sales department as regards obligation to the customer. Few realize the part played by aluminum in this revolution and particularly in its relation to general open-hearth practice and metallurgical control. For aluminum is one of the most difficult of metals to control at steel melting temperature and especially in the presence at these temperatures of the easily reducible metallic oxides.

THE accompanying article constitutes a brief abstract of the 1935 *annual Edward DeMille Campbell memorial lecture, delivered Oct.* 2 *in Chicago before the American Society for Metals by Harry W. McQuaid, metallurgist, Republic Steel Corp., Massillon, O. The title of Mr. McQuaid's address was "A Discussion of the Importance of the Aluminum Addition in Modern Commercial Steels."*

Development in control of open-hearth operations required to achieve results with aluminum to produce steels of definite heat treating characteristics, has been an accomplishment of no small moment to steel mill metallurgists. This urgent need of improving open-hearth operations to meet steel users' insistence on a product of uniform characteristics has resulted in improving the basic open-hearth product to the point that it can be made to a quality equal to any other method of producing commercial tonnage steels.

One of the reasons for keeping the part played by aluminum more or less a secret was the old prejudice against aluminum, due to its use in the past to quiet "wild" heats, etc. There had also been circulated considerable publicity as the disastrous effect of visible alumina inclusions on soundness, machinability and other requirements for good steel. This publicity was ascribed, of course, to aluminum as a deoxidizer and was due primarily to a lack of knowledge of how a heat of steel should be prepared before an extremely active element such as aluminum is added.

There is little if any evidence that the correct addition of a fairly large addition of aluminum to a properly prepared heat will increase to an unsatisfactory extent the amount of visible nonmetallics. It can not be denied that there is some tendency to an increase in the number of inclusions rated as oxides with an increase in aluminum, but the effect on the number of so-called slag inclusions is nil.

Increase in the oxide inclusion rating is at the worst small and affected by other variables than aluminum, such as temperature, rate of and extent of deoxidation, etc. Epstein states that aluminum either in the ladle or in the mold does not necessarily result in an increase in inclusions. In plotting inclusion ratings against aluminum additions, it was found that the low aluminum heats killed with manganese and silicon were lowest in oxide type inclusions, while the low-manganese, low-silicon heats with aluminum were the highest, as could be expected.

Less Aluminum in Electric Steel

In American basic electric furnace practice where a so-called reducing slag is used under which to complete the oxidation, it has been found that the amount of aluminum required to obtain a certain definite grain size is less than in the basic open-hearth heats which are more highly oxidized. It might be argued that the same quantity and distribution of aluminum oxide should give the same grain size and that no extra aluminum would necessarily be required, for the more highly oxidized heats unless a definite percentage of metallic aluminum in solution was required.

If a critical amount or particle size of aluminum oxide is necessary as would be expected, how could increasing aluminum above the minimum, produce fine grain in over oxidized heats? It seems rather doubtful if the delicate control implied by the necessity of obtaining critical partical size and distribution could be obtained at all in the highly oxidized heats, or that increasing aluminum to a uniformly higher amount would produce the same critical dispersion of oxide particles in the more highly oxidized basic open-hearth heats that would be obtained in the electric furnace heat with a lower aluminum addition.

It might be argued also that since the addition of approximately 1 pound of aluminum per ton will be sufficient to completely deoxidize or kill an ordinary open-hearth heat, no possible change could be made in the amount or size of the aluminum oxide with aluminum additions above 1 pound per ton. It is a well-known fact, however, that in the or-

dinary well-made basic open-hearth, plain-carbon heat which has been deoxidized with ferromanganese and ferrosilicon that considerably more than 1 pound of aluminum per ton in the ladle is required to obtain the very fine grain characteristics and that much higher additions than 1 pound per ton are required where the grain growth control specifications are exacting.

It seems more logical to assume that more highly oxidized heats require the excess aluminum to satisfy the oxide present and that the excess above that required to satisfy deoxidation requirements is necessary for grain growth control.

While it is difficult to prove, actual practice indicates very little effect in establishing fine grain characteristics is obtained by an aluminum addition until a certain definite minimum is added and then the fine grain effect is obtained very rapidly. This phenomena can be checked by any melter who has tried to govern his practice to obtain intermediate grain size control. He will insist that fine or coarse grain specifications are not so difficult to meet but that intermediate sizes are, in his opinion, "commercially impossible." This would indicate a very narrow range of particular sizes and dispersion, and if it is as difficult as a melter would insist, it would seem that it would be very difficult to obtain 100-ton heats of steel with the remarkable uniformity of grain size which can now be obtained in either the definitely coarse grain or fine grain types.

Little Variation in Control

One of the unexpected characteristics of grain size control is this uniformity, and to those of us who have checked thoroughly the grain size from the first molten steel in the furnace to the final products, there is nothing more remarkable than the fact that under normal conditions of processing that the variation in the McQuaid-Ehn grain size is almost commercially negligible.

That this should be the case where we are depending upon the submicroscopic dispersion of infusible particles of a very definite critical size, is hard to believe. There is no doubt, of course, but what the presence of such particles would have an effect upon the grain size, and hence play a part in the establishing of the grain size and grain growth effects. It would seem that the aluminum addition required to obtain certain grain growth characteristics in a heat of steel depends upon the degree of deoxidation of the bath before the addition is made, only to the extent that to obtain effects which are satisfactory, an excess of aluminum must be added over and above that required to satisfy deoxidation requirements. It is quite noticeable to anyone who is required to produce steel of fine grain type that the addition of manganese and particularly silicon tends to reduce the amount of aluminum required to obtain the fine grain characteristics.

It might be well to stress the fact that steelmaking is after all still an art, and that we must turn over to a few well trained men the problem of reducing a mixture of more than 100 tons of miscellaneous but selected scrap, pig, limestone, etc., to a condition where it represents a valuable and usable high-quality product, checked and inspected on every hand and which must not only meet close chemical specifications, but must harden deep enough but not too deep; must not warp too much, or crack in quenching, must machine well, must pass microscopic and macroscopic cleanliness tests, must pass so-called impact tests, transverse tests, grain size tests, etc. This modern miracle must be accomplished under most difficult working conditions at temperatures close to 3000 degrees Fahr. at which the very furnace is being destroyed in the making of the steel, a temperature at which the refractories used in ladle and runner are short lived and at which reactions proceed at incredible speeds, particularly those involving oxidation. Yet under these adverse conditions, and with all the care involved in the selection of the personnel, equipment and materials, the success or failure of the result depends upon being able to control the physical condition in the steel as it solidifies, of the additions to the steel of up to 1 part in 1000 of the most active of all the metallic elements we know of, that is, aluminum.

Truly, we cannot give too much credit to the man on the open-hearth floor.

Nitrogen Found To Produce Beneficial Effect in High Chromium Steels

MARKING an innovation in its policy, the American Society for Metals conducted simultaneous technical sessions on Tuesday morning, Oct. 1, during its annual convention at the Palmer House, Chicago. Each session was general in character, with three papers presented and discussed.

At the larger of the two sessions, Russell Franks, research metallurgist, Union Carbide & Carbon Research Laboratories Inc., Niagara Falls, N. Y., contributed a paper on the influence of nitrogen in steels of high chromium content. Observations strongly indicated that the marked refinement of grain imparted to the high chromium steels is brought about by nitrogen which is believed to be in combination with chromium as a nitride. Chromium nitride representing only a few hundredths of a per cent greatly increases the hardening capacity of low carbon 12 to 14 per cent chromium steels, a good indication that this nitride promotes austenite formation.

According to the author, the effect of this high solubility of the chromium nitride in low carbon iron of greater chromium content is far more pronounced, and in this respect the chromium nitrides seem to function in a manner similar to that of the carbides in ordinary steel. Addition of nitrogen to these low carbon-high chromium irons represents therefore a practical metallurgical procedure designed to limit grain size and to improve strength and toughness without unduly increasing hardness associated with brittleness, a result invariably obtained when carbon is employed for a similar purpose.

Concluding, Mr. Franks said "precaution must be exercised in making claims regarding the influence of nitrogen on corrosion resistance of the various high chromium steels, although it must be appreciated that the steels have been thoroughly investigated in this respect. Indications are that nitrogen does not seriously affect this property of the steels. However, it is recognized that the results of the well-known tests that are applied to the high chromium steels should be interpreted with caution, especially when the object in mind has to do with practical application. Experience with the chromium steels has taught that their value can be based only on service. Despite the fact that nitrogen has imparted such a pronounced improvement, it is felt that the steels to which this element has been added should be considered in like manner so that the utility of the nitrogen addition may serve industry to the utmost."

In discussion, E. C. Wright, National Tube Co., Ellwood City, Pa., verified Mr. Frank's conclusions by experience with an alloy containing approximately 25 per cent chromium, 0.12 per cent carbon and 0.25 per cent nitrogen. This alloy was made into seamless tubing which was later fabricated into a coil about 125 feet long. This required middle welding of short length tubing prior to coil-

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ing; several coils were successfully fabricated from this special analysis.

Experience of Mr. Wright showed the 25 per cent nitrogen bearing alloy to have much better forging characteristics than the plain chromium alloy of similar chromium content. It was also found that the alloys were much superior in every way to the plain alloys in responding to cold work. Probably the greatest advantage noticed in connection with the nitrogen containing alloys was the greater ease of welding and superior ductility after welding.

H. D. Newell, chief metallurgist, Babcock & Wilcox Co., Beaver Falls, Pa., said the investigation of Mr. Franks suggests that more reliable heat-resisting alloys may be the result, accomplishing this in incorporating a gaseous element which has heretofore been considered detrimental. It has been observed, he said, that nitrogen additions improve the life of cast alloys and welded overlays required to withstand combined heat and abrasive action. In this field, nitrogen-bearing alloys should find an increasing field of usefulness. The procedure of obtaining nitrogen by use of high nitrogen ferrochrome does not alter usual melting or casting practice although unsound castings may result from efforts to add a maximum nitrogen content.

Commenting also on Mr. Franks' paper in a written discussion, Dr. V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh, stated the conclusion derived from the author's work and some of his own must be that that addition of nitrogen to chromium steels is definitely a promising feature insofar as mechanical properties are concerned. The value of chromium alloys is their stainlessness. Speaking of this matter, therefore, the author correctly stated that nitrogen does not seriously affect this property of the steel. Introducing some check data on this point, Dr. Krivobok stated: "One may conclude that the influence of nitrogen toward resistance to nitric acid is definitely less harmful than that of carbon. If nitric acid tests are to serve as a criterion of resistance to corrosion to other media then the additions of nitrogen are not harmful."

Studies Chromium Still Tubes

Chromium steel tubes of the 4 to 6 per cent chromium type when used in refinery cracking stills in the form of coils are subject to embrittlement. Therefore, H. M. Wilten, metallurgical department, Texas Co., Port Arthur, Tex., conducted an investigation to correlate failures with the notched bar impact test and reported his results in the form of a paper. The embrittlement was found to agree with the laboratory temper brittleness test; steel that is temper brittle is subject to brittle failures, steel that is not temper brittle has not suffered brittle failures in service. Temper brittleness phenomena may not be accompanied by the precipitation. The author supported this opinion with service data.

In a comprehensive written discussion to Mr. Wilten's paper, Vincent T. Malcolm, director of research, and Thomas P. Jones, metallurgist, Chapman Valve Mfg. Co., Indian Orchard, Mass., stated they were somewhat disturbed over the unfortunate use of the term "embrittlement," as there was no evidence presented that true embrittlement was responsible for any of the phenomena discovered. It is true, they said, that there may be a loss of ductility or toughness due to one of several reasons other than brittleness. Use of the term "embrittlement" is unfortunate also for another reason, as it tends to give the impression that this type of failure differs radically from other types of failures under combined stress and temperature.

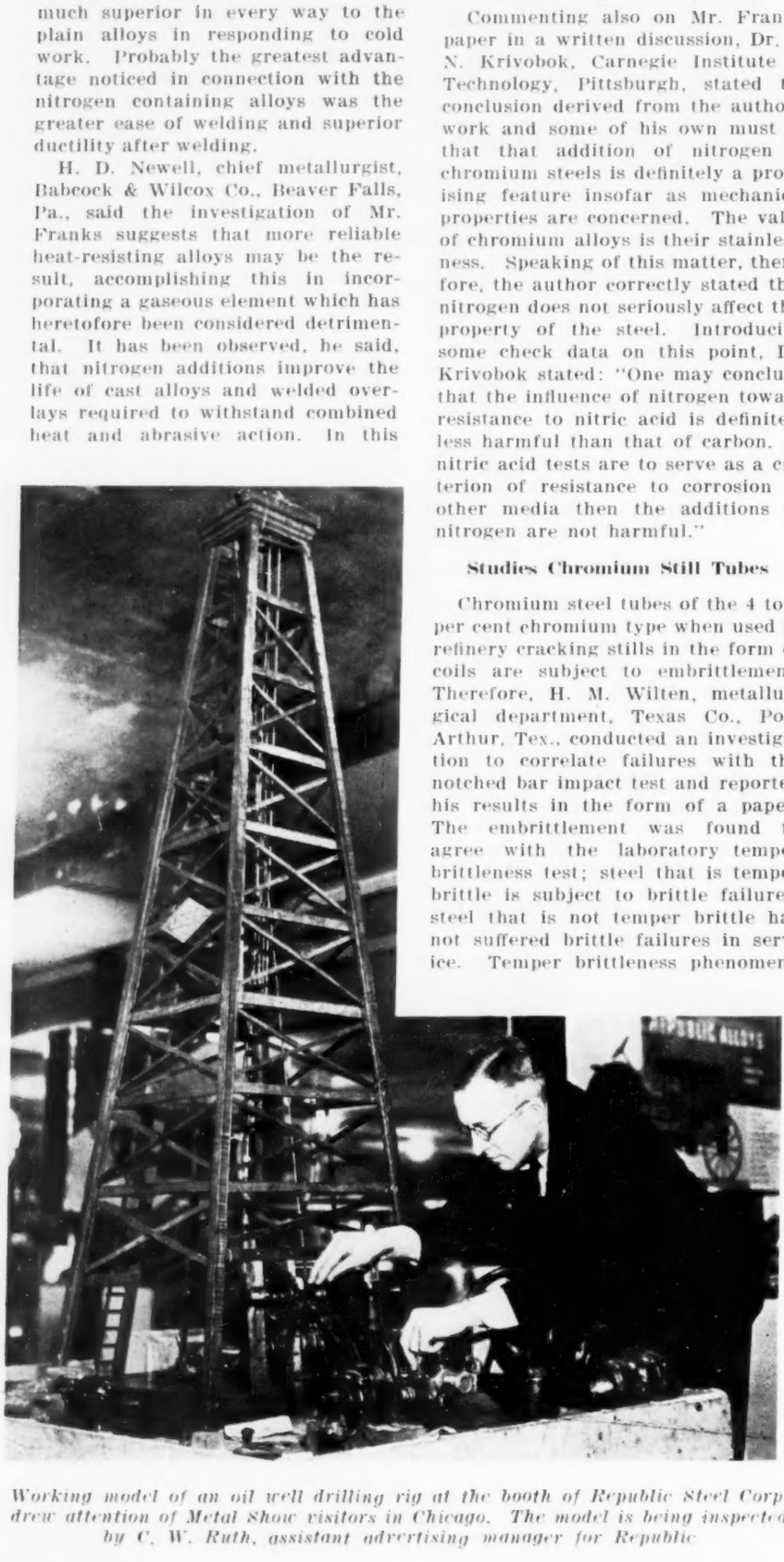
Urge New Terminology

Messrs. Malcolm and Jones believe that a more suitable term should be used in discussing this type of test as it is merely one phase of a large subject bearing on the influence of time, stress and temperature.

An interesting paper on the factors influencing the nature of the cutting speed-tool life curve was contributed by O. W. Boston, W. W. Gilbert and C. E. Kraus, department of metal processing, University of Michigan, Ann Arbor, Mich. For rating the machinability of a metal, with tool life as a basis, it is advisable to determine the cutting speed-tool life curve for desirable conditions, rather than to base conclusions on the tool life for one cutting speed determined for each of the variables. Results of tests were presented in the paper to show that the straight-line curve as plotted on log-log paper, may be changed in its vertical position on the scale and in slope from the horizontal, if any one of the factors, such as type of tool material, tool shape, shape of the cut, analysis or structure of the material cut, and the cutting fluid, are changed.

Four brands of high speed steels were shown to produce four distinctly different cutting speed-tool life curves when cutting a given steel under otherwise the same conditions. Curves of different height and slope were obtained when cutting steels of different analyses with the same tool material and tool shape, and when the heat treatment of steel of a particular analysis is changed. If the tool angles, comprising the back-rake, side-rake side-cutting angle, and the tool nose radius, are changed, different cutting speed-tool life curves are obtained.

The authors showed further that, when cutting one steel with each of several cutting fluids with a constant tool shape and a deep thin cut, one



Working model of an oil well drilling rig at the booth of Republic Steel Corp. drew attention of Metal Show visitors in Chicago. The model is being inspected by C. W. Ruth, assistant advertising manager for Republic

set of cutting speed-tool life curves is obtained. When the cut is shallow and thick but of the same cross sectional area, distinctly different curves are obtained for each of the same group of cutting fluids. Lastly, it is shown that, when cutting a given steel with a given tool and size of cut, individual speed-tool life curves are obtained for each of several cutting fluids. Those cutting fluids having supposedly superior lubricating properties appear to have less slope from the horizontal and are, therefore, superior for metal cutting where a long tool life accompanied by a low cutting speed is desired.

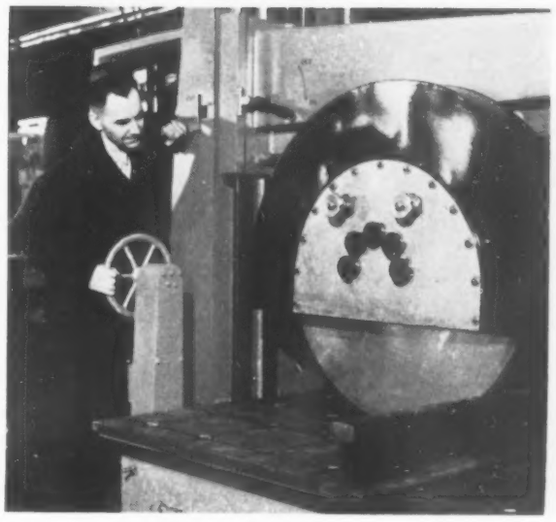
In the somewhat smaller simultaneous session, C. R. Austin, associate professor of metallurgy, Pennsylvania State college, State College, Pa., presented a two-part research paper on the high temperature properties of nickel-cobalt-iron base age-hardening alloys. The first part considered the mechanical properties, age-hardening characteristics, work hardening and temperature softening properties of the alloys.

The hardest alloy of the series investigated was found to maintain its remarkably high hardness—590-635 Vickers—at 1110 degrees Fahr. Part II was a study of the resistance of the alloys to high temperature oxidation and to chemical corrosion. Information on electrical resistivity and metallography also was recorded. For the purpose of affording a useful basis of comparison, the research included test data on well-known commercial alloys such as stainless 18-8 and 80-20 nickel-chromium alloys.

Oxidation Is Investigated

Observations on the oxidation of steel were reported in a paper by Miss M. Baeyertz, assistant research engineer, Illinois Steel Co., South works, Chicago. Plain carbon steels, S.A.E. 2330 and a series of commercial chromium and chromium-nickel stainless steels were oxidized at elevated temperatures. Oxidation was observed to take place in a discontinuous manner, this resulting from the preferential oxidation of silicon and chromium in advance of the oxidation of the iron in the alloy.

According to the author, stainless steels oxidized according to a general pattern in which similar oxide forms occurred in the different alloys. However, these similar oxide forms occurred at different temperatures depending on the chromium content of the alloys. The shift of oxidation type with chromium content and temperature is consistent with the known limitation of the low-chromium alloys to low temperature applications. Resistance of the stainless steels to oxidation at elevated temperatures appears to be due to the formation of two and possibly more oxides high in chromium.



ELECTRIC arc saw on display during the Metal Show in Chicago at the booth of Rich Mfg. Co. Ltd., Los Angeles with the inventor, Karl Strobel, at the controls. The saw itself, of a soft alloy steel, does no actual cutting. It acts as one pole of the low-voltage high-amperage current while the table on which the metal to be cut rests acts as the other pole. The electric arc jumps in a uniform line from the teeth of the saw to the material to be cut

Low-Alloy Steels Considered Ideal for Welding Use

LOW-ALLOY high-tensile steels have had no small part in the changing industrial picture. How they are meeting new requirements in design and production methods was impressively portrayed in a symposium which featured the Oct. 3 session of the American Welding society in Chicago.

A large audience heard A. E. Gibson, vice president, Wellman Engineering Co., Cleveland, one of four participants in the symposium, discuss the development and use of this class of material. These new steels, he said, are made of a large variety of alloys of varying quantity. To those unfamiliar with low-alloy steels it will be of interest to know that the high physical values are obtained in most instances with relatively low carbon content. This condition is ideal for welding, as it eliminates, almost entirely, the objectionable air hardening experienced in welding steels of the higher carbon range.

It is only recently that the steel industry has come to know the value of copper, in larger proportions than formerly used, in increasing physical values, he brought out. This is especially important in regard to the ratio of yield point to ultimate strength, particularly under certain thermal treatments. Even in the as-rolled condition, a 2 per cent nickel steel with 1 per cent copper will have a yield point 50 per cent higher than that of the same analysis without copper. Giving this same steel with copper a thermal treatment of 950 degrees Fahr. and air cooling will increase the ultimate strength about 20 per cent and will raise the yield point nearly 40 per cent. This increase of yield and ultimte strength of copper steel subjected to low thermal treatment is known as precipitation hardening.

The steels generally accepted and widely used in the low-alloy range in the as-rolled condition have yield points from 50,000 pounds to above 70,000 pounds per square inch, ultimate strength from 70,000 to 100,000 pounds per square inch, elongation in 2 inches from 20 per cent up, free bend tests of 180 degrees and high values of fatigue and impact. Naturally, in welded structures, Mr. Gibson explained, one must consider theh strength of the welded joint, but rarely is it impossible to obtain welded joint strength greater than that of the parent metal. This is true because in most instances increased sections can be obtained by the use of reinforcements or fillets in addition to complete penetration of the metal.

It has been proved possible, he declared, to effect savings in weight from 30 to 50 per cent in the use of low-alloy welded structures over previous designs of low-carbon steel. In redesigning dragline buckets using high-tensile chromium-manganese-silicon welded steel, which is bought on a specification of maximum 0.20 per cent carbon and minimum 60,000 pounds yield, the Wellman company has obtained weight reductions of over 30 per cent.

As his part in the symposium, Howard L. Miller, Republic Steel Corp., Youngstown, O., discussed the welding of copper-nickel-molybdenum

steels as performed in several body shops engaged in fabricating truck tanks and dump bodies. The object in using a high-tensile steel in this class of work, he explained, is to reduce tare weight and increase pay load. Reductions of 30 to 50 per cent in the gages of plates and sheets bring increased fiber stress in these structures and practically force the adoption of welding in order to utilize the full strength of the metal. A steel for this class of work must be ductile enough to form cold in regular fabricating tools, such as presses and brakes, and must be capable of being welded as easily as regular carbon steel. It must not produce hard or brittle welds and the welds and adjacent parent metal must be ductile and shock resistant enough to be put into service without heat treatment after welding.

Alloying Elements Changed

Elimination of all air-hardening elements such as chromium, silicon and vanadium, and the addition of copper, nickel and molybdenum in suitable proportions result in an alloy with inherently high strength in the ferrite which is not greatly dependent for its strength on its rate of cooling through the critical range. The copper, nickel and molybdenum in the proportions used dissolve completely in the ferrite and do not combine with the carbon. It is possible to produce sheet and plate from 18-gage up to ½-inch and find them very close together in physical proportions after a normalizing treatment.

Continuing the subject covering the welding of low-alloy steels, J. C. Holmberg, Struthers-Wells-Titusville Corp., Warren, Pa., pointed out that the practices of his company for the welding of these steels are the same as those used for plain carbon steel, although slight modifications naturally are indicated. The material has a higher elastic limit and it follows that rigidity is greater so that extreme care must be taken in assembling component parts. If possible, straightening or reforming should be prevented as areas adjacent to the weld prior to final heat treatment are often appreciably harder and do not lend themselves to plastic deformation in the same way as mild carbon steel. Through the use of carefully selected electrodes, Mr. Holmberg stated that his company daily is duplicating the physical properties of the plate material.

AT A LATER session of the American Welding society, S. C. Osborne, Wilson Welder & Metals Co. Inc., North Bergen, N. J., presented a paper, "Electrical Characteristics of the Welding Arc," which embodied a discussion of ionization, thermionic emission, the voltage gradient thermal losses and current uniformity in the welding arc. His conclusions with respect to the source of power for arc welding set forth that it should have a steep volt-ampere curve approaching constant current; the transient characteristic should be such that a high ignition voltage is instantaneously available after short circuit is broken; the current voltage should never drop below the base voltage required by the arc; current surge should be reduced to a positive minimum; a high open circuit voltage is not essential, it need be only high enough to establish short circuit current.

Results of tests described by John H. Blankenbuehler, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in his paper covering "Some Effects of Generator Characteristics on Welding Costs," disclosed that improvements in generator characteristics to obtain more constant current will give faster and better welding both because it improves the metal transfer in the arc and also because it makes it easier for the operator to start and maintain the arc.

In the manufacture of copper alloy tanks and containers, in the assembly of innumerable types of electrical applicances, apparatus for the chemical industries, corrosion-resisting structural members and architectural assemblies, resistance welded copper alloys find many applications, according to Ira T. Hook, American Brass Co., Waterbury, Conn. While principally concerned with resistance welding of gas tight seams in copper alloy sheet in his paper, Mr. Hook drew attention to the fact that some work has been done with other types of resistance welding. In all of the work on copper alloys, he has found that the one requisite is that the metal be melted at the time the two parts are given their final push together. Straight resistance butt welding is, therefore, not well adapted to the welding of copper alloys, he said.

Flash butt welding, on the other hand, offers effective means for uniting rods, sheet edges and shapes. The metals are brought into contact with the current on and the arc is allowed to play across the faces until the metal is molten, and the final push-up made quickly and lightly. Mr. Hook declared that the resistance butt and flash welding machines commonly built for welding steel usually do not have the light pressure and fast action that is needed for the successful flash welding of the copper alloys. There is no reason, however, he continued, why such skill cannot be built into a machine.

Quality Control of Cold Heading Wire Advances To High Degree

TONNAGE of wire for cold heading purposes produced in this country is as large, if not larger, than any single product in the entire field of wire manufacture. This fact was brought out by L. D. Seymour, metallurgist rod and wire department, Youngstown Sheet & Tube Co., Campbell, O., at the final session of the Wire association which held its annual convention at the Congress hotel, Chicago, Sept. 30 to Oct. 3. Reports of technical sessions held during the first two days were presented in last week's issue of STEEL.

In cold heading, the speaker explained, the amount of metal which can be upset and at the same time controlled in its movement, has a certain relationship to the diameter of the wire being upset. The length of wire varies, in certain instances, from the smallest up to the length equal to seven times the diameter of the wire. The farther the metal has to be moved, Mr. Seymour contended, the more difficult it becomes to control. Instead of trying to do it all in one blow, the more difficult heads, he stated, are made in a series of blows.

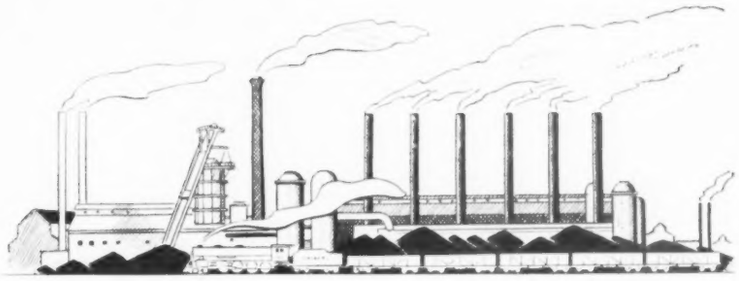
Seams and laps cause the largest number of failures, while small seams, scratches, guide marks, etc., form points of stress concentration where rupture may occur as the deformation increases. He pointed out that the extent to which nonmetallic inclusions affect the cold heading quality of wire is not fully known.

With the possible exception of cemented carbide dies Mr. Seymour cited the improvement in finishes or coatings as the most marked development in the art of wire drawing. He stressed the importance in cold heading practice of coating the wire with a substance which will not allow the wire to gall the die—one that will be thin enough and sufficiently hard not to ball-up in the die and prevent the blank from filling out.

Coatings Control the Finish

In general, the amount of lime on the rods prior to drawing is of importance, the speaker contended. In cases where an especially bright finish, with little or no coating is desired, a lubricant using vegetable oils as a base is preferred. Lubricants with an animal or mineral oil base have a tendency to build up the coat-

Zirconium Alloys *facilitate* GRAIN SIZE CONTROL



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Zirconium alloys provide a simple, convenient, and economical method of stabilizing the metal and facilitating grain size control. Zirconium is a powerful deoxidizer having a definite and regular effect. Through accurate control of the degree of deoxidation with zirconium alloys, successful production to definite grain size specifications can be achieved. An alloy containing 12 to 15 per cent zirconium and 39 to 43 per cent silicon is especially suitable for this purpose. It is cheap, clean, and uniform in analysis. Many steel plants are using it for controlling deoxidation to facilitate grain size control with consistent success.

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Ferrosilicon 75%
Ferrosilicon 80 to 85%
Ferrosilicon 90 to 95%
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Calcium-Aluminum-Silicon
Calcium-Manganese-Silicon
Silicon-Copper
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COLUMBIUM

TUNGSTEN

MANGANESE
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78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Spiegeleisen
Manganese Metal
Manganese-Copper
Miscellaneous Manganese Alloys

SILICO-MANGANESE
All grades including Silico-Spiegel

VANADIUM
All Grades

ZIRCONIUM
35 to 40% Zirconium
12 to 15% Zirconium
Aluminum-Zirconium
Zirconium-Manganese-Silicon

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ing and leave a tacky finish, he warned.

Mr. Seymour in referring to low-carbon heading wire, mentioned that the nearest approach to an ideal wire is obtained by the use of rimmed steel. This type steel has the toughness and hardness desirable to meet physical specifications contained in a square core which gradually blends itself into a thick skin or outside rim of soft ductile iron. This, in turn, readily lends itself to plastic flow and reduced abrasive wear on the heading dies. On the other hand, he stated, where specifications demand an increase in physical properties only attainable by heat treatment or where parts are to be surface hardened, it then becomes necessary to use a killed steel with increased amounts of carbon and other elements.

In discussing methods for testing cold heading stock, the speaker described the twist test widely used for this purpose. A sample is cut from the coil and is gripped and twisted five times. This is followed by untwisting five times. Any surface defects, he pointed out, will open up. This test, in the opinion of the speaker, is as severe as any employed in cold heading practice.

About 10 per cent croppage from the top of the ingot of, say, S.A.E. 1010 steel is sufficient to remove any segregation harmful to cold heading, Mr. Seymour stated, although in critical cases he placed the discard as high as 25 per cent.

Queried on Coatings

In replying to a question, "Do customers specify a sull coat on wire intended for cap screws?", Mr. Seymour pointed out that some do but that they frequently quench the product in oil to impart a bluish cast. In discussing the grain structure of cold heading stock, the speaker favored a coarse grain structure inasmuch as it improves the machining properties in the case of cut therads and greatly helps the die heads.

Methods of testing employed for controlling the quality of wire or meeting particular specifications were discussed by C. A. Kellogg, chief metallurgist, Continental Steel Corp., Kokomo, Ind., who spoke on "Tests and Testing."

E. W. Kempton, director of industrial relations, American Steel & Wire Co., Cleveland, was the principal speaker at an informal dinner of the Wire association held in the Congress hotel, the evening of Oct. 3. In speaking on "Industrial Relations as Applied to the Wire Industry," Mr. Kempton stressed the importance of foremen and of selling the company to the employes. He emphasized the importance of mutual benefit associations, pointing out that 54 per cent of the wiremakers have such plans.

A survey shows that seven wiremakers have a rating plan for employes in operation. Employe magazines, he declared, are published by ten wire companies; one company in the Pittsburgh district uses a page in the local newspaper for the benefit of helping its employes.

The large number of concerns contributing to employment insurance is promising, the speaker asserted, mentioning that 65 per cent of wire producers in this country already are contributors. He was of the opinion that group insurance programs should be compulsory.

Seven wire concerns report they have adopted a plan of vacation with pay for the wage earner. In fact, Mr. Kempton asserted, employes throughout the industry are becoming vacation conscious.

While 31 per cent of the wiremaking concerns have employe representation in effect, the speaker mentioned that no company in the wire industry depends on a trade union agreement.

AN INNOVATION was arranged for the concluding session of the Wire association, taking the form of a group conference on the subject of customer relations. Those in attendance were largely wire producers and wire users, and it was felt that by bringing them together to discuss openly various customer problems, interesting ideas might develop.

The meeting was opened by a formal discussion given by Kenneth Murray, sales staff, Republic Steel Corp., Chicago, under the title, "Save on Wire by Proper Ordering." He emphasized that with the rapid technical progress being achieved today, it is essential that purchasing, sales and service department keep abreast of progress in the wire mill. Introduction of new alloys, precise laboratory control methods, tungsten carbide dies and tools, better finishes, more uniform sizes, and the like are all advances affecting wire buying.

In ordering wire, the customer should observe a number of precautions such as indicating clearly the quantity desired, tolerances on size, kind of wire, physical properties, and desired finish. The producer will be able to meet the order more satisfactorily, Mr. Murray declared, if he is informed fully as to what sort of a job is to be done with the wire after it is received. Proper care in ordering will help to reduce the number of "hope" orders which Mr. Murray explained as the type in which the customer "hoped" to obtain the desired wire, and the producer "hoped" to supply the proper grade of wire.

Most wire salesmen today are thoroughly trained from a technical standpoint, and wire purchasers can buy to best advantage by giving the salesman a complete picture of their needs and problems.

Molten Metal Temperatures Are Recorded by Fitterer Thermocouple

IN CONNECTION with a round-table conference on temperature measurements of liquid iron and steel at a session of the Iron and Steel division of the American Institute of Mining and Metallurgical Engineers in Chicago, a paper by G. R. Fitterer, formerly associated in research with the bureau of mines, Pittsburgh, and the Metallurgical Advisory board of Carnegie Institute of Technology, was presented by J. J. Egan, Union Carbide & Carbon Research Laboratories, vice chairman of the meeting.

Mr. Fitterer, designer of the Fitterer thermocouple, is at present in Europe and could not be present to present his paper. The thermocouple is being built by Blaw-Knox Co., Pittsburgh, and is now in use at a number of blast furnaces and steel plants in this country. The couple comprises an external graphite tube element, within which is a silicon carbide rod. The lower end is placed in the molten metal bath to a depth of about 4 inches and the upper or cold junction is kept at room temperature by a system of coils through which water is circulated. It is characterized by the fairly large electromotive force which is generated, and by the close temperature readings which are possible.

Figures were cited in the paper of tests made on runner temperatures for various types of pig iron, as follows:

Runner temp., degrees Fahr.	Type of iron
2612	Low-Mn basic
2603	Low-Mn basic
2645	Low-Mn basic
2647	Medium-Mn basic
2524	High-Mn basic
2500	High-Mn basic
2650	High-Mn basic
2415 2478	Bessemer
2616 2700	Bessemer
2556	Bessemer
2885	Ferromanganese

Further figures were presented on three open-hearth furnace heats.

(*Please turn to Page* 57)

Many Factors Affect Quality In Metal Melting Practice

A FEATURE of the twenty-seventh annual autumn meeting of the Institute of Metals held in Newcastle-upon-Tyne, England, Sept. 9-12, was the fourteenth autumn lecture on "Metal Melting—Its Effect on Quality," delivered by Dr. H. W. Brownsdon, research manager, metal group, Imperial Chemical Industries Ltd.

Dr. Brownsdon defined his idea of quality not in terms of specifications, but on a much broader basis, namely, that a metal of high quality is that which meets the needs of the user to the fullest extent, making it clear that in one and the same metal or alloy very small changes in composition may render it unsuitable for some other. From a metal melting point of view, this control of quality became in effect a control of composition and that it is in this accurate control of composition that difficulties associated with metal melting arise.

He then reviewed the numerous factors influencing the composition, dividing these up under the headings of raw materials, contamination arising during melting, removal of undesirable constituents during melting and finally some other factors bearing on quality. He drew a simile between what the metallurgist has to do for the prevention and removal of undesirable constituents in molten metal with the part played by the surgeon in the curing of human ills, and referred to the melting pot as the operating table of the metallurgist, pointing out the many difficulties which the metallurgist meets in satisfactorily carrying out melting operations.

Secrets Still Unrevealed

It was shown by the lecturer that in metal melting it is the little things that matter and that in spite of all scientific investigational work that has been done on molten metals, some of the secrets still remain unrevealed. He then dealt with methods adopted for the removal of undesirable impurities, again stressing the difficulty of obtaining the desired object. Under this heading such subjects as the use of deoxidizing agents and fluxes, treatment with gases, and vacuum melting came under review. Perhaps one of the most difficult operations that the metallurgist has to face in the melting of metals is to free them from gases and special reference was made to this aspect of metal melting.

A paper on "Corrosion Below Discontinuous Oxide Coatings with Special Reference to Magnesium," was presented by K. G. Lewis and U. R. Evans, University Chemical Laboratories, Cambridge. Protective processes fall into two classes: (a) Safe processes, where even incomplete treatment lengthens the time of perforation; and (b) dangerous processes, where inadequate treatment intensifies attack and brings quicker perforation than no treatment.

In the work done by the authors, magnesium, uncoated and coated with oxide layers produced by three different treatments applied for numerous different periods, was subjected to sodium chloride in a new circulating apparatus. Time-corrosion curves and perforation periods were obtained. The data showed that these processes belong to the "safe" class.

"Protection of Magnesium Alloys Against Corrosion," was the title of a paper presented by H. Sutton and L. F. Le Brocq, Royal Aircraft Establishment, South Farnborough. Short-time chromate treatments of magnesium-rich alloys of two types in common use were investigated, and the protective value of the treatments were compared with the 6-hour chromate treatment and other forms of protective treatment. A bath was evolved capable of giving good films in 30-45 minutes, and which is suitable for use in steel or aluminum tanks.

The protective value of the 6-hour and short-time chromate treatments, with and without supplementary coatings of varnishes and enamels, was investigated with reference to typical alloys. Intermittent sea-water spray laboratory tests and beach exposure tests were carried out, and the corrosion which occurred was observed by loss of weight and change in mechanical properties. Experiments were carried out on the influence of cleaning treatments employed before chromate treatment.

Research in Magnesium Alloys

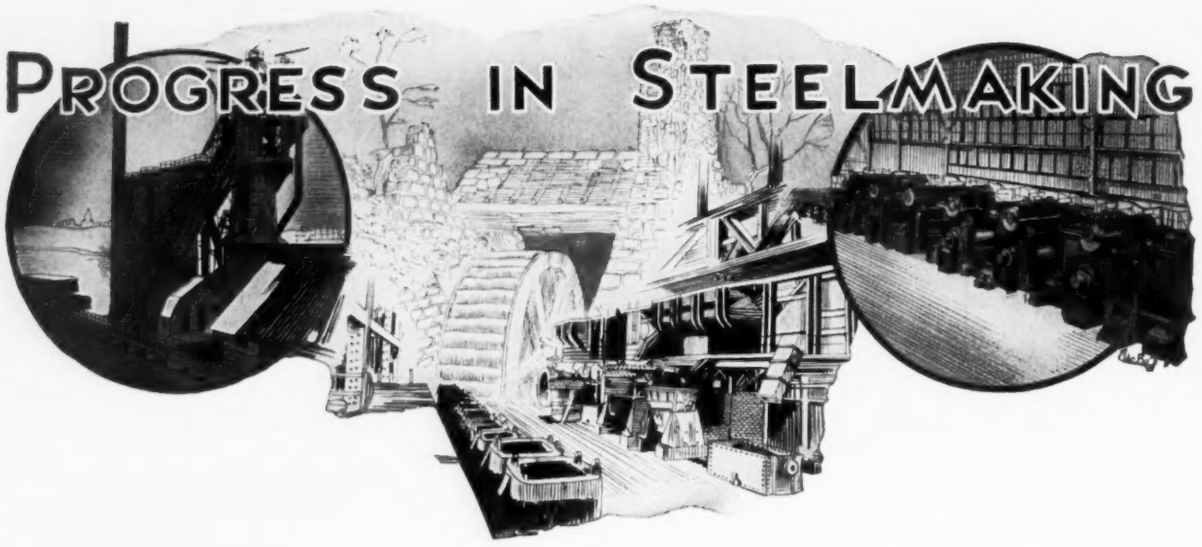
H. G. Hopkins, physics department, Royal College of Science, London, contributed a paper on "Electron Diffraction Examination of Protective Films Deposited on Magnesium and Magnesium Alloys by the R. A. E. Dichromate Process." The protective films in general yielded diffuse diffraction rings. It was concluded that the films consist of very small crystals oriented at random. It was tentatively suggested that the diffracting lattice is pseudo-morphic magnesium oxide.

"Alloys of Magnesium. Part III—Constitution of the Magnesium-Rich Alloys Containing Aluminum and Cadmium," was the title of a paper prepared by Dr. J. L. Haughton and R. J. M. Payne, National Physical Laboratory, Teddington. The authors discovered that addition of cadmium to magnesium-aluminum alloys depresses the liquid slightly, 20 per cent, cadmium lowering the liquidus temperature of an 80 per cent magnesium 20 per cent aluminum alloy by about 50 degrees Cent., but has practically no effect at the temperature of the aluminum-magnesium eutectic. It also reduces the solubility of aluminum in magnesium to a very small extent. No new phases were found up to 20 per cent of each added element, but attention was directed to an abnormal form of precipitation which was found in some of the alloys.

New Beer Can

PACKAGING OF BEER IN TIN CANS is receiving impetus by the development of a new container, shown above, by Continental Can Co. Inc., 100 East Forty-second street, New York. Tin plate of different gages is used, to meet the stresses incident to internal pressures generated by pasteurizing. The can is first completely manufactured after which a special lining is applied copiously to the interior at a substantially elevated temperature and allowed to drain out; by this method no portion of the interior remains unprotected. As soon as the can is drained and cooled, it is ready for use

PROGRESS IN STEELMAKING



Lowers Production Costs

Reducing the cost of producing small billet-sized ingots $4 a ton has been accomplished at a southern rolling mill by the installation of a 25-kilovolt ampere electric furnace with a rating of 3 to 4 tons of steel an hour. Country scrap or bundled steel and crops makes up the charge. Single slag basic steel with .0.025 per cent phosphorus is cast into billet molds and rolled direct into merchant bars, bolt stock and concrete reinforcing bars using the original heat of the billet. By this arrangement intermediate losses involved in the heating of ingots in soaking pits, converting them to blooms, cropping, reheating and rerolling to billets are eliminated. Hot rolled bars, 1 inch diameter made by this method as well as threaded bars, can be bent flat upon themselves while in a cold state, it is claimed, without cracking.

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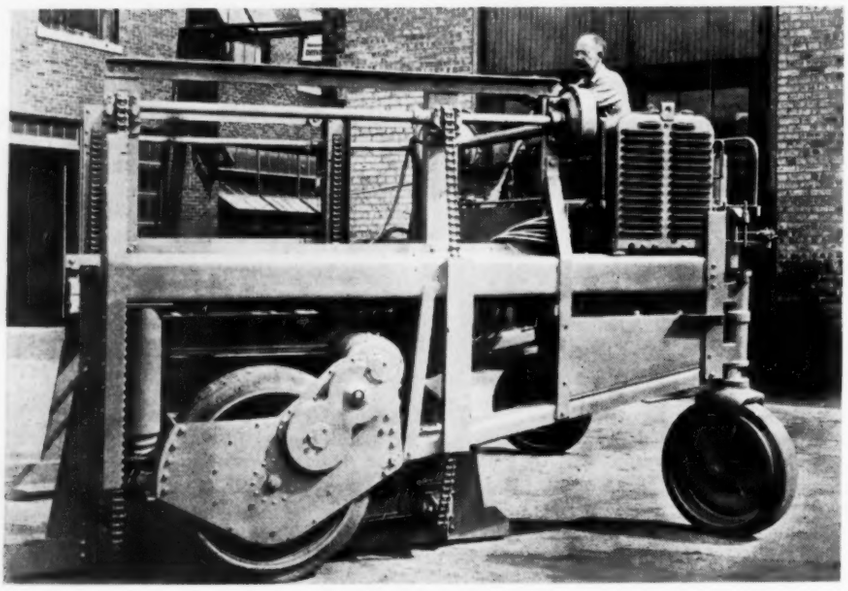
Simplifies Handling of Broad Sheets



LARGEST GAS-ELECTRIC TIERING MACHINE—Used for handling sheets 12 to 72 inches wide and of any length to and from shears, rolls, scales, warehouses, etc., at the continuous strip mill of the Youngstown Sheet & Tube Co., Campbell, O. The unit, built by the Ross Carrier Co., Benton Harbor, Mich., and equipped with General Electric motors and control, carries its own gas-electric power plant. In operation the machine merely straddles the load and lifts it. Material may be hoisted to a height of 6 feet and tiered or double decked. Loads up to 15 tons can be handled at a hoisting speed of 6 feet a minute. The pickup equipment is so arranged that the operator can adjust the width of the main lifting members to the load width and can shift the load from side to side for accurate spotting while tiering. All operations are controlled from the driver's seat. The machine is not restricted but can travel between bays and buildings

Reduces Wear on Shaft

Wear on the bridge line shaft of a crane, which serves the open-hearth mixer building at an Ohio steel plant, has been reduced to 0.008-inch after seven months operation. This is attributed to a cloth-type bearing containing a filler compound which was applied under pressure at the time of installation. No grease was added during the 7-month campaign nor was the shaft scored.

• • •

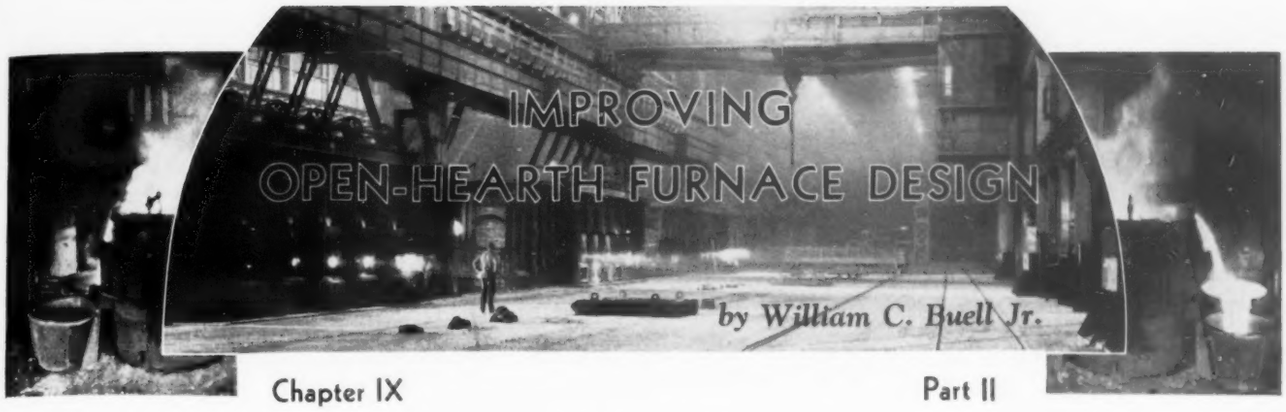
Corner Radius Important

Success in the use of tar as a mold wash, according to an open-hearth operator, depends largely on the corner radius of the mold. This type wash on molds designed with a large corner radius, results in corner cracks on the ingot. Asphalt lacquer is advocated by some German open-hearth operators as a mold coating.

• • •

Restores Wabbler Contour

Welding is employed at a midwestern tin mill for building up the worn pods of hot mill spindle wabblers. The spindles, 18 inches diameter and 10 to 20 feet long, are made of high-carbon cast steel. Approximately 80 pounds of ¼-inch rod is used to restore the four pods of each wabbler to their original contour. Each bead then is peened with a blunt tool by means of an air hammer to prevent expansion of the weld. A hard surface rod is used on top of the built-up portion to combat wear when backlash occurs.



IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter IX — Part II

Factors for Calculating Thermal Effects in Regenerators

RECONSTRUCTED temperature conditions at the regenerator outlets and developed from the several actual charts are shown in Figs. 164 to 168.

The regenerators of the furnace from which Fig. 164 is reconstructed are too small but the short reversal cycle tends to increase furnace gas temperature. In design the regenerators should be such as to develop furnace gas outlet temperatures no greater than 1200 degrees Fahr. when coke oven gas is the fuel.

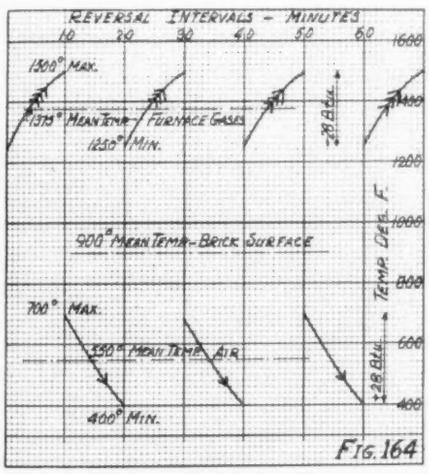
The air regenerators of the producer gas furnace, Fig. 165, are about 80 per cent of the correct theoretical size. Were they enlarged the mean outlet temperature of the furnace gas should drop to about 1300 to 1350 degrees Fahr. which would be a satisfactory condition for producer gas firing. The thermal action in the gas regenerators of the same furnace, Fig. 166, is the best that could be secured.

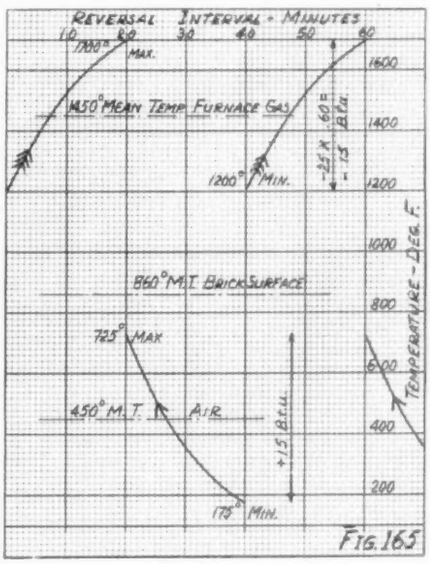
Due to small regenerators the effluent furnace gas temperature, Fig. 167, is much too high. Regenerators of satisfactory design would reduce the mean temperature of the furnace gas to about 1200 degrees Fahr.

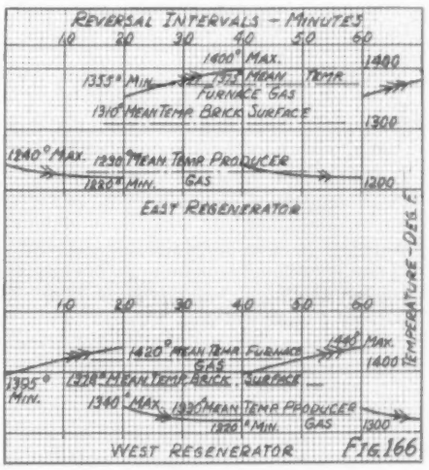
Somewhat greater regenerative action to reduce the furnace gases, Fig. 168, about 100 degrees or to about 1250 degrees Fahr. should be secured, which would represent the economic size or design.

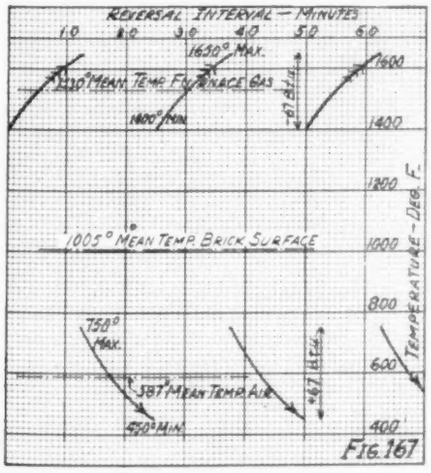
From studies based on the foregoing and similar data the arbitrary effluent furnace gas temperature, line 19, Table CXXIX, was found as presuming to represent a good order of design.

The incoming producer gas tem-









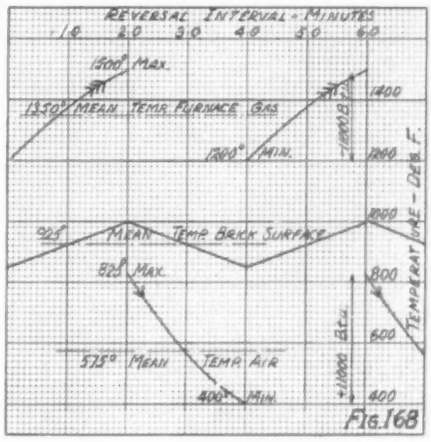


Fig. 164—Diagram of temperature relations—regenerator outlets, Fig. 159

Fig. 165—Analysis of temperature relations—outlets air regenerators, Fig. 161

Fig. 166—Analysis of temperature conditions—outlets gas regenerators, Fig. 161

Fig. 167—Diagram of temperature relations—regenerator outlets, Fig. 162

Fig 168—Diagram of temperature relations—regenerator outlets, Fig. 163

perature at $A_{12}G$, line 35, was taken from Fig. 166. In both of the producer tests listed, Table CXXIX, the gas valves were of the now obsolete above-ground type. The inclusion of the slide type valve conserves more than 108 degrees of temperature in the producer gas.

The incoming air temperature at A_{12} will be modified principally by the length of the flue between the air inlet valve and A_{12}. The data of the charts, Figs. 164 to 168, indicate the average temperature to be considerable. In the usual experience 500 degrees, line 39, seems a fair figure.

The values for producer gas leaving the regenerators at $A_{11}G$, line 36, and the air leaving at A_{11}, line 40, represent an average when containing about 60 per cent of the heat left in the regenerators from the furnace gases, and the several values have considerable experimental substantiation.

ITEM 2. The second item listed at the beginning of the present chapter as necessary to the analytical study of thermal effects in regenerators is information as to the quantity of heat contained in the various fluids when entering and leaving the regenerators.

After examining the papers and data accompanying the balances of Table CXXIX, the determination of heat quantities likely will appear as difficult and exacting. Any values as found are subject to severe criticism and doubt as to accuracy. A simple and rapid method of determining such data, which can be subject to no more severe criticism than the like data of the exact tests probably will give as high a degree of accuracy as any results calculated from the data of open-hearth operation, is as follows:

HEAT INPUT		B.t.u.
In products of combustion at $A_{11}A$ 114,000×0.60×131 B.t.u. (Fig. 169)		8,960,400
In the 10% excess air 114,000×(66×0.10) B.t.u.		725,400
Total process heat to regenerator		9,685,800
	B.t.u.	
In products of combustion at $A_{12}A$ 114,000×0.60×59 B.t.u.	4,035,600	
In the 10% excess air 114,000×(30×0.10) B.t.u.	342,000	
Total process heat from regenerator		4,377,600
Total process heat left in regenerator		5,308,200
HEAT TRANSFER	B.t.u.	
In air leaving regenerator at $A_{11}A$ 115,000×44 B.t.u.×1.19	5,517,600	
In air entering regenerator at $A_{11}A$ 114,000×11 B.t.u.×1.10	1,379,400	
Total process heat to air		4,138,200
Radiation and other losses (difference)		1,170,000
To balance		5,308,200

The method consists of a system by which a quantitative analysis dealing in the concrete values of B.t.u. rather than the abstract coefficients of qualitative analysis, of the entire furnace or any individual component of the system may be secured with the least essential data. In order to develop balance figures information is required only as to the temperatures of all fluids entering or leaving the component under examination, the composition and quantity of the fuel introduced into the furnace and Orsat analyses of the furnace gases to determine the combustion condition. If the analysis is to cover or include the upper furnace then the thermo-physical-chemical data of the charge must be calculated by conventional methods and appropriately introduced.

The principal concern at present is in regard to heating effects in regenerators and the description is developed as applying only to regenerative action but the extension of the system to include other components will be obvious.

To apply the system the fuel analysis is taken and solved for the theoretical air of combustion, the combustion products and the calorific value. The data from which the first two items may be found is given in Table CXXXI and the latter in Table CXXXII*.

Both the high and low values of hydrogen are included in the values, Table CXXXII. Contrary to usual American combustion practice, however, the low values are used on the grounds it is both unnecessary and

*These tables are from a former serial work of the author, "Testing and Rating of Fuel Fired Industrial Furnaces," *Fuels and Furnaces*, November 1928 to February 1931.

Explains Ambiguity

OWING to the fact that the present series of open-hearth articles contains occasional references to the original series, which appeared in STEEL, *from Oct. 3, 1932, to Aug. 14, 1933, it seems desirable to explain the relationship which exists between the original and revised texts of these series.*

The original articles (STEEL, *Oct. 3, 1932—Aug. 14, 1933*), *have been revised, amplified and greatly expanded for publication in two books, the first of which will be published in a few months and the second shortly thereafter. The series now running in* STEEL *later will be published in book form as Volume III to complete the trilogy.*

In the current series, where references to the original series are made, the author has worked from the manuscript of Volumes I and II rather than from the original text. Accordingly, where no or only slight revision of the data of the original articles has occurred reference may be made to such in the current series, but where the revision of the data has been substantial, *or if the reference is to material* ***which is new in the book manuscript, then the reference of necessity is made appropriately to the text of the forthcoming Volumes I and II.***

THE EDITORS

Combustion Data

REQUIRED FOR COMBUSTION

	per 1 lb. Substance				per 1 cu. ft. Substance			
	O_2 lbs. A	Air lbs. B	O_2 ft.³ C	Air ft.³ D	O_2 lbs. E	Air lbs. F	O_2 ft.³ G	Air ft.³ H
Carbon to CO_2	2.667	11.541	29.892	143.0				
Carbon to CO	1.334	5.771	14.945	71.5				
Carbon Monoxide*	0.572	2.471	6.411	30.7	.0446	.1927	0.5	2.393
Sulphur	1.000	4.320	11.208	53.6				
Hydrogen	8.000	34.624	89.664	429.0	.0446	.1927	0.5	2.393
Methane	4.000	17.312	44.832	214.5	.1784	.7708	2.0	9.570
Ethane	3.733	16.156	41.839	200.2	.3122	1.3489	3.5	16.748
Acetylene	3.077	13.313	34.487	165.0	.2230	.9635	2.5	11.963
Ethylene	3.429	14.836	38.432	183.9	.2676	1.1562	3.0	14.355
Benzene	3.077	13.313	34.487	165.0	.6691	2.8903	7.5	35.888
Derivation	M W of O_2 required / M W of Substance	A x 100 / 23.15	A x 11.208	A x 100 / 20.9	G x .08921	E x 100 / 23.15	Calculated	G x 100 / 20.9

*CO @ SO_2

inane to load such figures with the values of the latent heat of the hydrogen-oxygen reaction. These figures have no effect on thermal conditions in high-temperature operation, can never be recovered, and serve merely to indicate an unnaturally high final or chimney loss.

(To be continued)

Reports on Tests with Fitterer Thermocouple

(Concluded from Page 52)

taken 15 minutes before tapping, with an 11-foot thermocouple:

Per cent carbon at time of reading	Thermocouple temp., degrees Fahr.
0.40	2850
0.40	2950
0.86	2836
0.76	2896
0.14	2812
0.10	2890
0.11	2910
0.40	2910
0.32	2890
0.17	2820
0.20	2890
0.13	2860
0.64	2900
0.45	2895
0.46	2960
0.41	3000
0.11	2830
0.20	2980
0.10	2970

By plotting temperature against carbon content, as obtained from these thermocouple tests, new light is thrown on liquidus-solidus curves and phase diagrams in general, Mr. Fitterer pointed out in his paper.

W. E. Forsythe, Nela Park division, General Electric Co., Cleveland, described temperature measurements with the disappearing filament optical pyrometer. For high temperatures, it is necessary to use a monochromatic screen with the optical pyrometer, and Mr. Forsythe discussed the meaning and use of the effective wave length of the screen.

Methods of calibrating the optical pyrometer were outlined and he declared that an optical pyrometer can be calibrated just as definitely as any other temperature measuring device. Reproductions of accuracy tests demonstrated that excellent results can be obtained by even untrained or slightly trained observers with this form of pyrometer.

New Thermometer Principle

(Concluded from Page 36)

are mutually counterbalanced—was found to offer a mathematically balanced unit which was both more rigid and more compact. In most applications the unit requires no supporting bearing at the working end. Even when a bearing is desirable, there is no tendency for a shift in the axis of rotation, which ordinarily leads to varying frictional resistance at this point.

Having developed the ideal form of coil by mathematical analysis, Bloch then discovered that there was no equipment in existence on which such coils could be wound. Consequently, a new type of coil winding machine had to be worked out by the scientist before the principle could be successfully utilized.

Perfected machines of this kind are now being installed at the plant of the Weston Electrical Instrument Corp., Newark, N. J. Studies to provide a background for using the principle in instruments specifically designed to meet American requirements are now being carried on by the Weston organization.

Table CXXXII

Heat from Combustion of Certain Fuel Components

(Values as at 32 deg. Fahr. and 30" Hg.)

Gas or Vapor	Reaction	BTU High Value per lb.	BTU High Value per ft.³	BTU Low Value per lb.	BTU Low Value per ft.³
Carbon to CO_2	$C+O_2=CO_2$	14521		14521	1368
Carbon to CO	$C+CO_2=2CO$	4351		4351	
Carbon Monoxide	$2CO+O_2=2CO_2$	4362	321	4362	321
Sulphur	$S+O_2=SO_2$	3998		3998	
Hydrogen	$2H_2+O_2=2H_2O$	60626	321	51354	272
Methane	$CH_4+2O_2=CO_2+2H_2O$	23646	1066	21577	962
Ethane	$C_2H_6+3.5\ O_2=2CO_2+3H_2O$	22027	1845	20312	1699
Acetylene	$C_2H_2+2.5\ O_2=2CO_2+H_2O$	22918	1567	20840	1511
Ethylene	$C_2H_4+3\ O_2=2CO_2+2H_2O$	21300	1700	20525	1602
Benzene	$C_6H_6+7.5\ O_2=6CO_2+3H_2O$	19572	4040	17418	3787

Table CXXXI

Including Air for and Products of Combustion

PRODUCTS OF COMBUSTION

per 1 lb. Substance CO_2 lbs.	H_2O lbs.	N_2 lbs.	CO_2 ft.³	H_2O ft.³	N_2 ft.³	per 1 cu. ft. Substance CO_2 lbs.	H_2O lbs.	N_2 lbs.	CO_2 ft.³	H_2O ft.³	N_2 ft.³	Symbo
I	J	K	L	M	N	O	P	Q	R	S	T	
3.667		8.874	29.860		113.108							C-CO_2
2.334*		4.437	29.860*		56.555							C-CO
1.572		1.899	12.801		24.289	.1227		.1478	1.0		1.893	CO
2.000@		3.320	11.208@		42.392							S
	9.000	26.624		179.316	339.336		.0502	.1478		1.0	1.893	H_2
2.750	2.250	13.312	22.393	44.829	169.668	.1227	.1004	.5909	1.0	2.0	7.570	CH_4
2.933	1.800	12.423	23.883	35.863	158.361	.2454	.1506	1.0340	2.0	3.0	13.248	C_2H_6
3.384	0.692	10.236	27.556	13.787	130.513	.2454	.0502	.7387	2.0	1.0	9.463	C_2H_2
3.142	1.286	11.407	25.585	25.618	144.468	.2454	.1004	.8864	2.0	2.0	11.355	C_2H_4
3.384	0.692	10.236	27.556	13.787	130.513	.7361	.1506	2.2160	6.0	3.0	28.388	C_6H_6
Calculated	Calculated	B - A	I x 8.143	J x 19.924	D - C	R x .1228	S x .0502	T x .0786	Calculated	Calculated	H - G	

COMBUSTION DATA
Figured as at 32° F.—30" Hg.
Computed that Air by:
Weight = 23.15% O_2 and 76.85% N_2
Volume = 20.9% O_2 and 79.1% N_2

NEW EQUIPMENT

Roto-Broach—

Bullard Co., Bridgeport, Conn., announces its latest development, Roto-Broaching. The Roto-Broach can be applied to manufacturing units of the multiple or single spindle types as long as the machines provide for properly rotating the work at cutting speed and for movement of the tool relative to the work. The accompanying illustration shows a 12-spindle, Contin-U-Matic equipped with both internal and external Roto-Broach; six spindles continuously rough and finish internally, while the other six rough and finish externally.

In some instances the Roto-Broach cutter blades may be arranged to pass at a tangent to the periphery of the work. In other cases a circular series of blade edges may enter internally or surround externally a circular workpiece to accomplish turning of either interior or exterior surfaces, in a single plane or in several planes.

Blades are used preferably in parallel and each blade has a decided clearance angle, thereby preventing undue friction and heating. Each blade also preferably should include an angular rake surface which may terminate in a well rounded or circular surface so as to properly discharge chips without undue strains.

The maker says that with this tool it is possible to obtain maximum tool life due to the fact that the work is being operated on by as many roughing cutters as may be required and as many finishing cutters as may be required, all in a single pass of the tool. No one blade is subjected to continuous action or is overburdened by too deep a cut. Also, with one chucking, the tool will perform both roughing and finishing operations at a single pass of one tool block.

• • •

Upright Drilling Machines—

Cincinnati Bickford Tool Co., Oakley, Cincinnati, is introducing an improved line of 21, 24 and 28-inch upright drilling machines. These units are built with either round or box column as shown in the accompanying illustration. The 24 and 28-inch sizes provide 12 speeds in ranges from 60 to 1000 revolutions per minute or 90 to 1500 revolutions per minute and 9 rates of power feed. The 21-inch size provides 9 speeds in any one of 5 optional ranges and 4 rates of power feed.

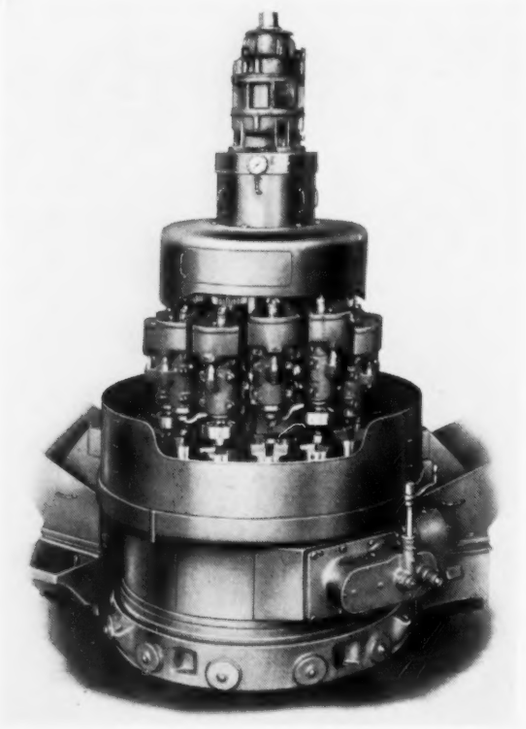
A new feature is the use of a reversing motor for tapping instead of mechanical reversing clutches. A lever at the left of the head operates pushbuttons controlling the forward the reverse rotation and stopping of the spindle.

Possibility of damage to the rack and pinion has been eliminated by the incorporation of a spring bumper which effectively cushions the spindle return. These units can be furnished to suit individual requirements with special equipment in the nature of multiple drill heads, flanged spindle sleeve, and auxiliary guide for rigid drill head mounting, automatic spindle return, and in gang drill construction.

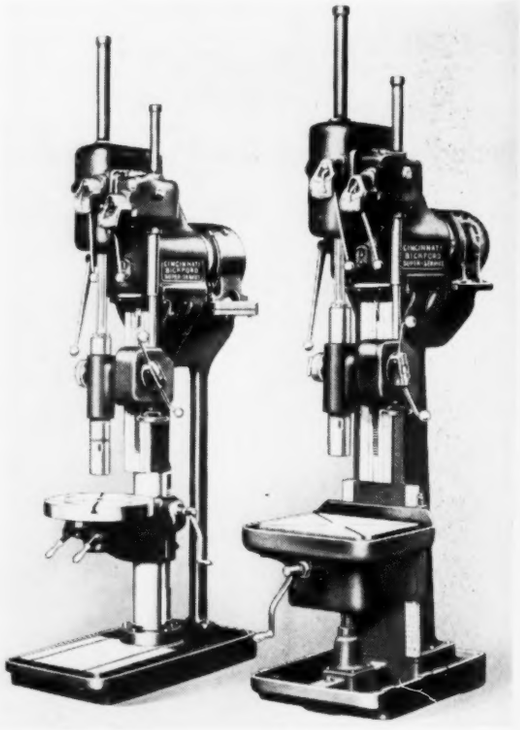
• • •

Lathe Spindle Nose—

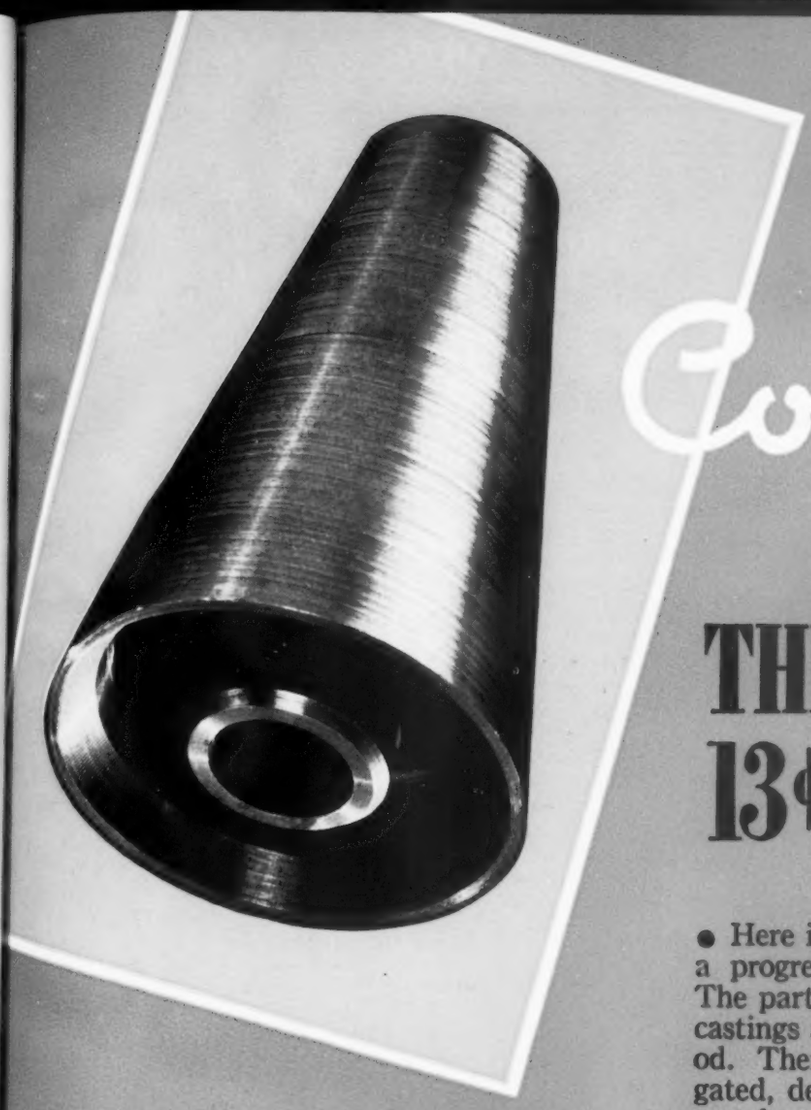
Monarch Machine Tool Co., Sidney, O., announces the adoption of



(Left) Bullard 12-spindle Contin-U-Matic machine equipped with both internal and external Roto-Broach devices



(Right) Improved line of Cincinnati - Bickford upright drilling machines, built with either round or box column as shown



NOW MADE FROM Cold Drawn Steel.... THIS PART COSTS 13¢ LESS

Formerly made from a casting, this spindle is now manufactured at less cost and with greater strength from a 2 7/16-inch round cold drawn steel bar. It is tapered to approximately 1 1/4 inches.

● Here is an interesting outcome of the search of a progressive manufacturer for new economies. The part illustrated naturally suggests the use of castings and for years it was made by that method. Then Union Cold Drawn Steel was investigated, despite the fact that the obvious waste of metal and required amount of machining argued against any possible savings. Trial showed, however, that costs were materially reduced, due largely to the exceptional machinability of cold drawn steel.

Union Cold Drawn Steel opens up many avenues for savings because of its pronounced machinability, its smooth, bright surface, its high degree of accuracy, its marked uniformity and its extensive variety of shapes and sizes. It provides distinct superiorities in physical properties over hot rolled bars, iron castings, steel castings and forgings. It promotes the most efficient operation of automatic screw machines.

Even though cold drawn steel may at first appear impractical for many applications, don't pass judgment without a thorough investigation. It has a great deal to offer and its field is widening day by day.

UNION DRAWN STEEL CO. MASSILLON, OHIO

SUBSIDIARY OF
REPUBLIC STEEL CORPORATION

Cold Drawing
PROVIDES MAXIMUM MACHINABILITY

Union SPECIAL FINISH

COMBINES GOOD APPEARANCE WITH EXTREME ACCURACY

• The ground and polished surface of these small diameter bars adds beauty to the design of modern machines. Their finish is excellent for nickel or chrome plating. Just the thing for exposed shafts or other uses, particularly where straightness, concentricity, precision in size and improved mechanical strength are desired.

You can secure Union Special Finish of any carbon or alloy steel grade, in short pieces or long bars and in all fractional sizes from ⅛ in. to 1⅛ in. inclusive. The commercial tolerance is exact size to minus .002". Closer tolerances — exact to within a total of .0005", or exact to .00025" under on standard sizes only — can be furnished on special order.

The illustrations on this page indicate many types of applications. They will likely suggest similar profitable uses in your production.

We also furnish cold drawn flats, squares and special shapes of all sizes with ground and polished finish on one or more flat surfaces.

UNION DRAWN STEEL CO. MASSILLON, OHIO

SUBSIDIARY OF
REPUBLIC STEEL CORPORATION

COLD DRAWN, GROUND AND POLISHED

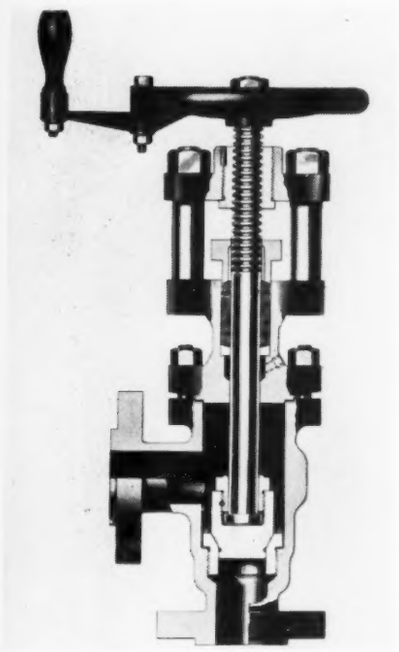
Union Cold Drawn Steels

the new American standard cam-lock flanged spindle nose as optional equipment on all sizes of its engine lathes and toolroom lathes, from 12 to 18-inch inclusive. Advantage of the cam-lock type of spindle is said to lie principally in the ease and quickness with which chuck plates and fixtures can be clamped to or removed from the flanged spindle nose. Chuck manufacturers are now in a position to furnish steel bodied chucks machined to fit directly to the cam-lock flanged spindle nose, without the use of an adapter plate.

◆ ◆ ◆

Hard-Seat Blow-off Valve—

Yarnall-Waring Co., Chestnut Hill, Philadelphia, has developed a forged steel hard-seat valve, supplementing



Yarnall-Waring forged steel hard-seat blow-off valve

its line of forged steel seatless blow-off valves. The new valve, illustrated, is made for two pressure ranges, 600 and 1500 pounds, and is of the seat-and-disk type, with inlet under seat. Body is a flanged steel forging of angle pattern with side outlet; bottom flanged inlet nozzle is screwed in and welded. Stainless steel seat ring, heat treated and ground, is screwed into nozzle on lower end of body. Pillar or marine type yoke with threaded bushing provides simple, sturdy guide for the steel stem. Stainless steel disk is attached to stem by disk nut pinned in place. Disk bevel is faced with Stellite, then ground, to provide hard-wearing surface at this point. A lip on the lower end of the disk checks wire drawing action of the blow-down and protects bearing faces of

General-duty welding torch manufactured by Linde Air Products Co.

the seat and disk. The stem has a shank extending above packing; threaded section is not exposed to high temperature.

◆ ◆ ◆

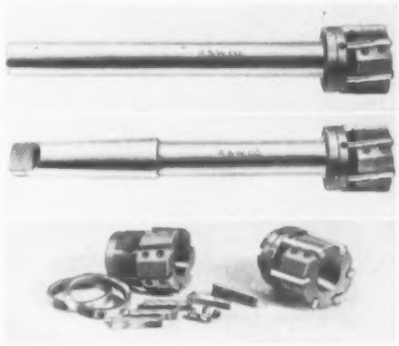
Welding Torch—

Linde Air Products Co., 205 East Forty-second street, New York, is introducing a new general-duty welding torch known as Purox No. 35. It is constructed of extruded brass, Monel metal and drawn copper, with silver soldered tubes. Ribbed design of the handle enables it to be gripped easily. Connections are ferrule type and extend parallel to the axis of the handle. Individual mixers in each welding head are so designed that maximum resistance to flashback is afforded and at the same time the effective range of each size tip is increased. Nine tips perform the duty of 15. Hexagonal socket arrangement permits the welding head to be assembled in the most convenient of six optional positions in relation to the body.

◆ ◆ ◆

Drill Sharpener—

Wells Mfg. Co., Greenfield, Mass., has developed a new type of drill sharpener, shown in an accompanying illustration, and known as model 18D. By means of this grinding equipment, it is said that every variable in the drill point is covered—point angle, relief, web thinning, chisel-edge angle and corner removing. By removing the sharp, pointed corners of the drill at the periphery, the life and endurance of the drill is prolonged. Capacity is two lip right-hand twist drills, ¼ to 1-inch inclusive, any point angle and any relief from 6 to 12 degrees. Power is supplied by a 1/3-horsepower motor, with a 7x1x1-inch straight wheel on the right motor extension for



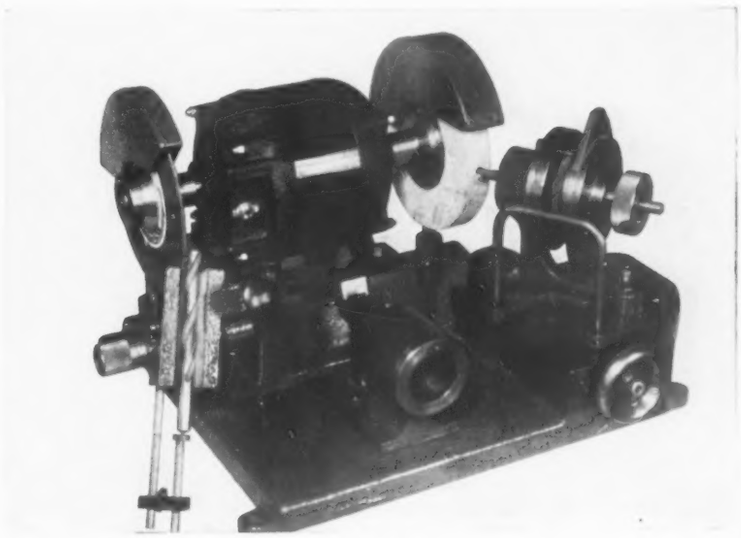
Pratt & Whitney Camlock reamers render practical many reamer applications never previously regarded possible for production reaming

drill sharpening, and a 7x3/32x1-inch straight wheel on the left extension for web thinning. The unit takes bench space about 15½ inches square; weight complete is 110 pounds.

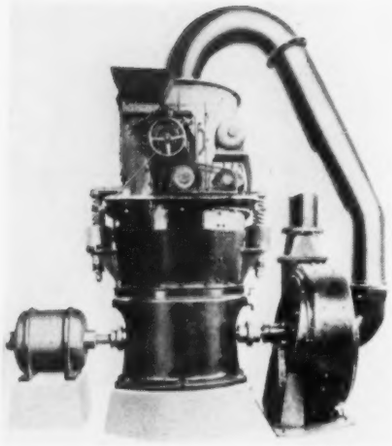
◆ ◆ ◆

Serrated Blade Reamers—

Pratt & Whitney Co., Hartford, Conn., announces a line of adjustable, serrated blade reamers of a new patented design. Shown in the accompanying illustrations, these new tools are said to render practical many reamer applications



Drill sharpener developed by Wells Mfg. Co. Wheel at left is for web thinning, wheel at right for sharpening



Raymond bowl mill for pulverizing coal, recently introduced by Combustion Engineering Co. Inc.

which previously were not considered as practicable for production reaming. The new reamers are of heavy construction. Serrations on one side of each blade fit into the corresponding serrations in the reamer body. Two cams lock each blade in place. Two nuts at the back end of each blade permit easy adjustment for size. Because of the design, the alignment and positioning of the blades in the reamer body are maintained accurately and positively.

The new reamers are known as Camlocks. In all types the blades are pushed forward to increase the cutting diameter. This permits them to function equally well in through holes, blind holes or against shoulders.

• • •

Coal Pulverizer—

Combustion Engineering Co. Inc., New York, has announced a departure from conventional types of pulverizers — the Raymond bowl mill. Central feature of the mill is a revolving bowl, or grinding chamber. Due to centrifugal force the coal, which is ground between the reduction rolls and the grinding ring, works its way up the walls of the bowl. As the ground particles reach the rim, the fines and intermediate sizes are picked up by the air current coming up from the annular spaces around the bowl and are carried into the separator above for further classification. As the finished material is separated out, the oversize particles drop back and re-enter the mill with the raw feed. Rolls are held in a fixed position by the heavy journal heads supported on trunnions that rest on the top plate of the mill. Clearance between rolls and revolving bowl may be adjusted from the outside while the mill is running. Bowl revolves on a vertical shaft, mounted on roller bearings and is driven through a worm gear by a horizontal mainshaft, direct connected to a constant-speed standard motor.

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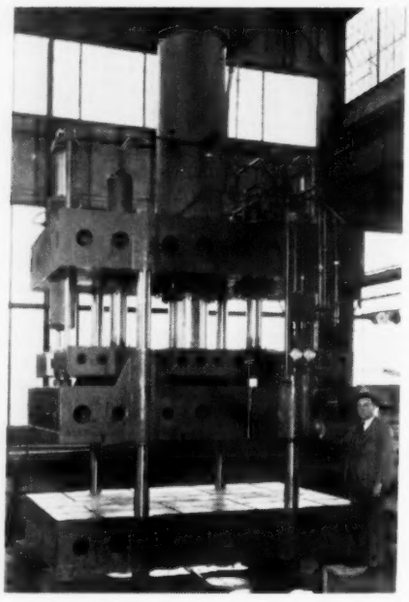
Autobody Panel Press—

Lake Erie Engineering Corp., Buffalo, has developed a high speed hydraulic press for forming autobody



Lake Erie hydraulic autobody panel press has capacity of 250 tons and is specially adapted for high-speed production on short runs

panels. It has capacity of 250 tons and a 72 x 130-inch bed. It is arranged with blank holder for clamping the sheet; pressing and clamping pressures are quickly adjustable to suit the work.

The new press is especially adapted for semi-production work where short runs are the rule rather than the exception. It is arranged for easy setting of the dies and a single lever gives complete control of the press movement. The press is double acting. The clamping pad or blank holder is held down by means of pins passing through the moving platen and bearing against the clamping platen. Uniform clamping pressure is maintained by a set of hydraulic cylinders.

Both drawing and clamping pressures can be adjusted quickly over a wide range, allowing the operator to use the combination that is best suited for each piece.

• • •

Drilling, Tapping and Milling Machine—

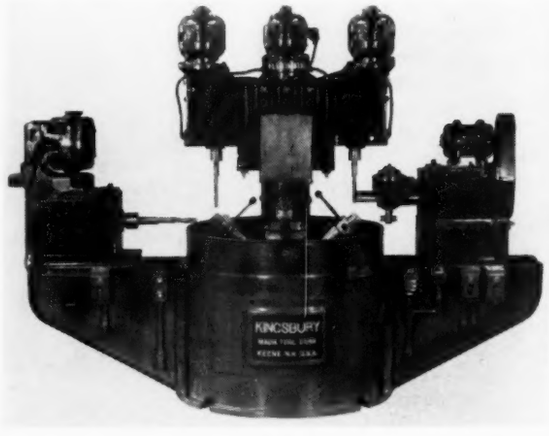
Kingsbury Machine Tool Corp., Keene, N. H., announces a new center column, automatic indexing type machine to perform a maximum of drilling, milling, threading or analogous operations at exceptionally high production rates. Known as the Fleximatic, this machine is shown in the accompanying illustration. The various operations are handled by units developed by this company, each having self-contained drive and feed. Due to the fact that the units can be readily located to suit the requirements of the job there is almost no limitation in the scope of work to which the machine can be adapted.

The machine can be furnished for 4, 5, 6, 7, 8 or more indexes of the table per revolution. Double indexing can be provided if desired. The rotary table has diameter of 36 inches with 32-inch finished surface for fixtures.

• • •

Detachable Socket Wrenches—

Armstrong Bros. Tool Co., Chicago, announces a complete line of chrome-vanadium steel sockets for detachable head socket wrenches. These new sockets come in all sizes and types from the 5/32-inch miniatures for fine electrical work to the 2½-inch extra heavy duty sockets. Included in this new line are both double-hex (12 point) and double square sockets, sockets for miniature, light, standard, heavy-duty and extra heavy-duty drivers; and handles, extensions, and ratchets.



Kingsbury Fleximatic is designed for performing drilling, milling, threading and similar operations at exceptionally high speeds

War Influences Felt; Steel Rate Wavers

Uncertainties Offset Rise In Autos, Structurals; Coke By-Products Strong

MARKET IN TABLOID

DEMAND . . . *Automobile, structural, shipbuilding stronger; tin plate slower; little from railroads.*

PRICES . . . *Steady.*

PRODUCTION . . . *Ingots down 1½ points to 52 per cent. Steel ingot output for year now equal to entire 1934 output.*

SHIPMENTS . . . *Pig iron heavier; finished steel down moderately.*

NOTWITHSTANDING heavier automobile and structural steel commitments, steelworks operations last week were unable to resist retarding influences due mainly to lower tin plate production and lack of railroad orders, declining 1½ points to 52 per cent.

To some extent, also, the present wavering tendency in steel is traceable to war influences, uncertainties being felt by many consumers, a situation somewhat like that which prevailed at the outbreak of the World war in 1914.

The war already has resulted in strong demand on the American steel industry from Italy and other European countries for coke oven by-products, such as benzol and toluol, used in high explosives. It has led to larger buying of non-ferrous metals.

Prices of foreign manganiferous ore, and iron ore from North Africa and Sweden, imported by American steelmakers, have risen sharply. Although there has been some moderate buying of tin plate and steel bars for shipment to Egypt, no inquiries have yet developed for finished steel which could be construed as directly intended for war purposes. Scrap exports to Italy have actually fallen off, following many months of heavy purchasing by that country.

Meanwhile, new commitments for steel from automobile manufacturers continued to expand, automobile production increasing for the third consecutive week to 32,000 units, up 7200 from the preceding week.

Rush requests from some automobile interests for bars last week disclosed that certain Pittsburgh mills are unable to deliver before Nov. 1, due to heavy specifications from miscellaneous sources. Most makers of steel mill equipment in the Pittsburgh district are booked at capacity well into 1936. Farm implement business so far this year is 55 per cent over 1934, and manufacturers are making optimistic forecasts for the remainder of the year, and 1936.

Activity in heavy finished steel was an outstanding feature of the markets. Structural shape awards made a substantial gain to 26,170 tons, and reinforcing bars to 11,675 tons, including 14,000 tons of shapes and bars for public work projects in Los Angeles and San Francisco. For the Los Angeles electrical transmission system 2000 tons of aluminum wire was placed. At New York 30,000 tons of new structural steel projects came up for bids.

Shipbuilding figured more prominently. International Mercantile Marine-Roosevelt Steamship Co. will take bids shortly on 15,000 tons of hull steel for a liner, and 3600 tons will be required for three streamlined ferryboats for New York. The navy awarded a 10,000-ton cruiser, 6500 tons of steel, and took bids on 5300 tons of plates for submarine and destroyer construction. Fourteen river barges, taking 3200 tons of plates, were placed at Pittsburgh.

Pig iron shipments this month have increased 23 per cent over the comparable period in September, chiefly because of larger consignments to automobile, heating apparatus and agricultural implement manufacturers. Scrap is quieter, although the undertone is strong.

Steel ingot production in September averaged 113,193 gross tons daily, 4.7 per cent over August, although output for the month, 2,829,835 tons, was 3 per cent less than in August, because of fewer working days. For the first nine months this year, 24,044,076 tons is 17 per cent above that in the first nine last year.

By this week, ingot production for the year to date will be practically equal to the 25,599,118 tons output in the entire year 1934.

Steelworks operations in the Chicago district last week dropped 2 points to 58 per cent; Detroit 6 to 88; Cleveland 3 to 59. New England was up 2 points to 68 per cent; other districts unchanged.

STEEL's iron and steel price composite advanced 3 cents to $32.86. The scrap index held at $12.75 and the finished steel composite remained $53.70.

COMPOSITE MARKET AVERAGES

	Oct. 12	Oct. 5	Sept. 28	One Month Ago Sept., 1935	Three Months Ago July, 1935	One Year Ago Oct., 1934	Five Years Ago Oct., 1930
Iron and Steel	$32.86	$32.83	$32.84	$32.82	$32.44	$32.10	$32.35
Finished Steel	53.70	53.70	53.70	53.70	54.00	54.00	50.13
Steelworks Scrap	12.75	12.75	12.79	12.65	10.64	9.40	12.32

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Oct. 12, 1935	Sept. 1935	July 1935	Oct. 1934
Steel bars, Pittsburgh	1.85c	1.85c	1.80c	1.80c
Steel bars, Chicago	1.90	1.85	1.85	1.85
Steel bars, Philadelphia	2.16	2.11	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.40	2.40	2.60	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	Oct. 12, 1935	Sept. 1935	July 1935	Oct. 1934
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.81	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.31	19.26
No. 2 foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.68	20.68	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.75	24.25	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.67	18.80

Scrap

Heavy melting steel, Pittsburgh	$13.75	$13.45	$12.30	$10.50
Heavy melt. steel, No. 2, east. Pa.	11.00	11.25	10.50	8.00
Heavy melting steel, Chicago	12.50	12.55	10.40	8.75
Rails for rolling, Chicago	14.00	13.90	11.25	9.90
Railroad steel specialties, Chicago	13.75	13.75	12.00	9.75

Coke

Connellsville, furnace, ovens	$3.55	$3.25	$3.30	$3.60
Connellsville, foundry, ovens	4.30	4.00	4.25	4.60
Chicago, by-product foundry, del.	9.75	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 5 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight carloads; less than straight carloads take trade quantity extras; 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.40
Cement coated nails	2.40
Galvanized nails, 15 gage and coarser	4.40
do. finer than 15 gage	4.90

(Per pound)

Polished staples	3.10c
Galvanized fence staples	3.35c
Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 gage	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni 1.05
5100 0.80-1.10 Cr 0.45
5100 Cr. spring base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅞-in.

Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	75 off
Rolled thread, ½ x 6, smaller	75 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	75 off
Tire bolts	60 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	75 off
Step bolts	70 off
Elevator bolts	70 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	75 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv.	take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.55- 3.70
Connellsville, fdry.	4.30
Connell. prem. fdry.	5.30- 5.65
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	9.00
*Chicago, del.	9.75
New England, del.	
*St. Louis, del.	10.00
Birmingham, ovens	6.00
*Indianapolis, del.	9.25
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
*Detroit ov., out del.	9.00
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		15.00c
Toluol		30.00c
Solvent naphtha		30.00c
Commercial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	20.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40,	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10,	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus $1.21	67c, 81c and switching charges		
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50,	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.50
Pitts. dist. fur.	18.00	Do., del. Chicago	24.75
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga.,Ky.,	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsb'gh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent Spot, $5 a ton higher.	126-130.00
Silicoman., 2½ carb. 2% carbon, 95.00; 1%,	90.00 105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper, Electro. del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead, New York N. Y.	Lead, East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Oct. 5	9.00	9.12½	8.60	50.50	48.75	4.50	4.35	4.75	*19.00	14.25	35.00
Oct. 7	9.25	9.37½	8.85	51.00	49.37½	4.60	4.45	4.75	*19.00	14.50	35.00
Oct. 8	9.25	9.37½	8.85	50.75	48.87½	4.60	4.45	4.85	*19.00	14.87½	35.00
Oct. 9	9.25	9.37½	8.85	51.25	49.37½	4.60	4.45	4.85	*19.00	14.87½	35.00
Oct. 10	9.25	9.37½	8.85	52.12½	49.80	4.50	4.35	4.85	*19.00	14.87½	35.00
Oct. 11	9.25	9.37½	8.85	53.00	50.70	4.50	4.35	4.85	*19.00	14.87½	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets

*Yellow brass (high)	14.62½
*Copper hot rolled	16.25
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50

Tubes

*High yellow brass	16.62½
*Seamless copper	17.75

Rods

*High yellow brass	13.12½
*Copper, hot rolled	13.50

Anodes

*Copper untrimmed	14.00

Wire

*Yellow brass (high)	15.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	5.75- 6.00
*Cleveland	5.87½-6.12½
*Chicago	6.00-6.12½
*St. Louis	6.00- 6.25

Heavy Copper and Wire

*New York, No. 1	7.00- 7.25
*Chicago, No. 1	7.00- 7.25
*Cleveland	7.25- 7.50
*St. Louis, No. 1	7.35- 7.37½

Composition Brass Borings

New York	5.50- 5.75

Light Copper

*New York	6.00- 6.25
*Chicago	5.50- 5.75
*Cleveland	5.75- 6.00
*St. Louis	6.00- 6.25

Light Brass

*Chicago	3.25- 3.50
*Cleveland	3.12½-3.37½
St. Louis	3.50- 3.75

Lead

New York	3.50-3.87½
Cleveland	3.25- 3.50
*Chicago	3.50- 3.75
*St. Louis	3.75- 3.85

Zinc

New York	2.50- 2.75
Cleveland	2.50- 2.75
St. Louis	2.75- 3.00

Aluminum

Borings, Cleveland	8.50- 9.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.00-13.50
Clips, soft, Cleve.	14.75-15.00

SECONDARY METALS

*Brass ingot, 85-5-5-5	9.25
Stand. No. 12 alum.	16.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dock, expt.	9.00- 9.25
Boston, domestic	7.50- 7.75
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.75
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50- 9.00
Eastern Pa., No. 1	12.00
Eastern Pa., No. 2	11.00
Federal, Ill.	9.25- 9.75
Granite City, R. R.	10.50-11.00
Granite City, No. 2	8.50- 9.00
N. Y., deal. No. 2	7.50- 7.75
N. Y., deal. barge	8.50- 8.75
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)	13.50-14.00
Pittsburgh, No. 2	12.25-12.75
St. Louis	8.50- 9.00
Valleys, No. 1	13.00-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.50-11.00
Chicago, factory	11.50-12.00
Chicago, dealer	10.25-10.75
Cleveland	11.50-12.00
Detroit	10.25-10.75
E. Pa., new mat.	11.50-12.00
Pittsburgh	13.50-14.00
St. Louis	6.25- 6.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	8.00- 8.50
Cincinnati, del.	7.50- 8.00
Cleveland	9.50-10.00
Pittsburgh	12.00-12.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati	7.00- 7.50
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	14.50-15.00
Chicago (3 ft.)	14.00-14.50
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	13.50-14.00
Detroit	12.50-13.00
Pitts., open-hearth, 3 ft. and less	16.50-17.00
St. Louis, 2 ft. & less	13.25-13.75

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	12.25-12.75
Pittsburgh	14.75-15.25
St. Louis	11.50-12.00
Buffalo	12.00-12.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	3.50- 3.75
Buffalo	10.50-11.00
Chicago	8.00- 8.50
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.00- 7.50
Eastern Pa.	9.50
N. Y., deal. fdry.	6.00
St. Louis	8.00- 8.50

COUPLERS, SPRINGS

Buffalo	14.25-14.75
Chicago, springs	13.50-14.00
Eastern Pa.	14.50-15.00
Pittsburgh	16.50-17.00
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.00-12.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.25-14.75
Cleveland, billet, bloom crops	15.00-15.50
Eastern Pa., crops	15.50-16.00
Pittsburgh, billet, bloom crops	16.75-17.25
Pittsburgh, sheet bar crops	16.00-16.50

FROGS, SWITCHES

Chicago	12.25-12.75
St. Louis, cut	11.50-12.00

SHOVELING STEEL

Chicago	12.25-12.75
Federal, Ill.	9.25- 9.50
Granite City	8.50- 9.00

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	12.00-12.50
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	12.25-12.75
Cincinnati, No. 2	9.50-10.00
Eastern Pa.	12.00-12.50
N. Y., No. 1, deal.	9.50-10.00
St. Louis, No. 1	6.75- 7.20
St. Louis, No. 2	10.25-10.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	10.00
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	11.00-11.50
Cinci., No. 1, deal.	7.50- 8.00
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	9.00- 9.50
Valleys, new, No. 1	12.25-12.75

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	3.25- 3.50
Buffalo	5.75- 6.25
Chicago	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Cleveland	7.75- 8.25
Detroit	5.50- 6.00
Eastern Pa.	7.50- 8.00
New York, dealers	3.75- 4.00
Pittsburgh	9.75-10.25
St. Louis	2.25- 2.75
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.00- 7.50
Cincinnati, dealers	5.00- 5.50
Cleveland	8.00- 8.50
Detroit	6.50- 7.00
Eastern Pa.	6.00- 6.25
New York, dealers	1.50- 1.75
Pittsburgh	8.50- 9.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.25- 7.75
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	8.00- 8.50
Detroit	6.00- 6.50
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	5.50- 6.00
Eastern Pa.	9.00- 9.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.75- 6.00
Buffalo	10.50-11.00
Cleveland	10.00-10.50
Detroit	8.50- 9.00
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston, dealers	4.50- 5.00
Chicago, heavy	13.50-14.00
Eastern Pa.	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Eastern Pa.	11.00
St. Louis	7.75- 8.25

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point	10.50-11.00
Buffalo	14.50-15.00
Chicago, net	14.75-15.25
Eastern Pa.	17.00
St. Louis	12.50-13.00

SHAFTING

Boston, ship point	13.00-13.25
Eastern Pa.	18.50
New York, dealers	13.25-13.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	8.00-10.00
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	14.50-15.00
Chicago, iron	12.50-13.00
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	10.00-10.50
Eastern Pa., iron	12.50-13.00
Eastern Pa., steel	14.50-15.00
Pittsburgh, iron	14.25-14.75
Pittsburgh, steel	16.00-16.50
St. Louis, iron	10.00-10.50
St. Louis, steel	12.00-12.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 1 mach.	9.00- 9.25
Boston, No. 2	8.00- 8.25
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	12.00-12.50
Buffalo, mach.	13.00-13.50
Chicago, agri. net	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, mach. net	11.50-12.00
Chicago, railr'd net	10.00-11.00
Cinci., mach. cup.	10.00-10.50
Cleveland, cupola	12.25-12.75
Detroit, net	10.00-10.50
Eastern Pa., cupola	12.00-13.00
E. Pa., mixed yard	10.50
Pittsburgh, cupola	14.00-14.50
San Francisco, del.	13.50-14.00
Seattle	7.50- 9.00
St. Louis, No. 1	9.50-10.00
St. L., No. 1 mach.	11.75-12.25

HEAVY CAST

Boston, del.	6.00- 6.25
Buffalo, break.	10.50-11.00
Cleveland, break	10.00
Detroit, No. 1, mach. net	12.00-12.50
Detroit, break.	8.50- 9.00
Detroit, auto net	11.50-12.00
Eastern Pa.	11.00-11.50
N. Y., break. deal.	6.75- 7.25
Pittsburgh	13.00-13.50

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	13.50-14.50
Buffalo	14.00-14.50
Chicago, R. R.	14.50-15.00
Cincinnati, agri. del.	11.00-11.50
Cleveland, rail	15.50-16.00
Detroit, auto net	12.50-13.00
St. Louis, R. R.	12.75-13.25
Eastern Pa., R. R.	13.00-13.50

RAILS FOR ROLLING

5 feet and over

Birmingham	11.50-12.00
Boston, dealers	8.00- 8.50
Buffalo	12.00-12.50
Chicago	13.75-14.25
Eastern Pa.	13.00-14.00
New York, dealer	10.50-11.00
St. Louis	12.25-12.75

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	11.75-12.25

LOW PHOS. PUNCHINGS

Buffalo	14.25-14.75
Chicago	14.50-15.00
Eastern Pa.	15.00-16.00
Pittsburgh (heavy)	16.00-16.50
Pittsburgh (light)	15.00-15.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.05c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.70c
San Francisco	3.45c
Seattle	3.70c
St. Louis	3.20c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c

REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.46c
Philadelphia*	2.98c
Pittsburgh (h)	3.15c
Portland (i)	3.70c
San Francisco	3.45c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh (h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh (h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.30c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York (d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL	
Baltimore (c)	3.58c
Boston	3.75c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.87c
Tulsa	4.50c

COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.55c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c

TOOL STEELS (Applying on or east of Mississippi river; west of Mississippi 1c up)	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS (100 pounds or over)	Discount
Chicago (a)	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70-10-5

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 inches; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 10

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.31 3 2 6	$13.99	1 15 0
Basic bessemer	15.31 3 2 6*	12.91	1 12 0
Hematite, Phos. .03-.05	15.93 3 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$26.95 5 10 0	$18.98	2 7 0
Wire rods, No. 5 gage	41.65 8 10 0	36.38	4 10 0
FINISHED STEEL			
Standard rails	$40.43 8 5 0	$36.34	5 10 0
Merchant bars	1.64c 7 10 0	1.14c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.62c 7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.75c 8 0 0	1.54c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.03c 9 5 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	1.37c 6 5 0	1.19c	8 15 0
Bands and strips	1.86c 8 10 0	1.45c	4 0 0
Plain wire, base	2.03c 9 5 0	1.85c	5 7 6
Galvanized wire, base	2.35c 10 15 0	2.28c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.63c 12 0 0	2.10c	5 15 0
Tin plate, box 108 lbs.	$4.41 0 18 0	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.54 3 7 6(a)	$17.13	260	$12.51	370	$25.34 63
Basic bessemer pig iron	17.15 3 10 0(a)	12.52	190	11.15	330	27.96 (b) 69.50
Furnace coke	4.04 0 16 6	6.26	95	3.89	115	7.64 19
Billets	26.95 5 10 0	28.34	430	18.25	540	38.82 96.50
Standard rails	1.81c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.88c 8 12 0	1.68c	560	90c	600	2.01c 110
Structural shapes	1.92c 8 15 0	1.65c	550	90c	600	1.97c 107.50
Plates, †¼-in. or 5 mm.	1.98c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.41c 11 0 0§	1.80c	600‡	1.24c	825‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.85c 13 0 0	3.23c	1,075	2.25c	1,500	6.77c 370
Plain wire	2.03c 9 5 0	3.15c	1,050	1.73c	1,150	3.17c 173
Bands and strips	2.05c 9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 64.70 per cent over paper sterling.

Bars

Bar Prices, Page 64

Pittsburgh—Rush shipping requests by some automotive users of steel bars have forced certain bar mills to announce their inability to comply, owing to consistently good orders they had received earlier from other sources. One bar mill is now booked up until Nov. 1 and through last week could not accept orders for shipment before that time. Carbon bars hold at their recently adopted base price of 1.85c, Pittsburgh, for 5 to 25-ton lots, whereas alloy bars remain 2.45c, Pittsburgh, regardless of quantity.

Cleveland—A temporary lull in bar orders has followed the placing of tonnage, to be specified during the fourth quarter, prior to the price advance of $1 a ton Oct. 1. However, producers expect this month will mark a new high point for the year in shipments. Automobile forge shops are taking considerable more material than in September. Chrysler has released a substantial tonnage for springs.

Chicago—Automotive demand for steel bars gradually is improving. Shipments to most other consumers are steady or slightly more active. Requirements of farm implement manufacturers continue heavy. While most consumers are ordering for relatively early needs, individual purchases have increased as a result of the new quantity differentials and extras.

Boston—While releases are slightly heavier buying of commercial steel bars has not materially changed since the first of the quarter when volume slackened following broader protective covering. Volume in forging and alloy bars is well sustained. Most current business in carbon steel bars is for lots under 25 tons with 1.85c, Pittsburgh, applying.

New York—Bar tonnage for the month so far is off slightly from September, in line with general expectations. However, business is substantially ahead of last year.

Philadelphia—Movement of commercial steel bars since the first of the month has been off somewhat, as was expected in view of anticipatory buying by small consumers, who comprise the great majority of bar purchasers here, prior to the inauguration of the new quantity extras and deductions. However, there is still a moderately good amount of new business. The base price is 1.85c, Pittsburgh, or 2.16c, Philadelphia.

Washington — Bids close Oct. 22 on 245 tons of black and galvanized steel bars for the navy yards at Boston, 70 tons; Philadelphia, 35 tons; Norfolk, Va., 70 tons, Charleston,

OUTSTANDING
MILPACO
OIL SEALS
Milpaco Oil Seals rank with the outstanding achievements of 1935. Characteristic design and construction establish them as unusual.
Details of design and construction in Milpaco Oil Seals—some very minute—make them more effective sealing and protective units, and give them longer life in active service.
Exact chemical and physical processes applied for every kind of application, qualify Milpaco Oil Seals for specific conditions.
Intensive research, laboratory and field tests, have disclosed some mighty interesting facts about Milpaco Oil Seals in the Automotive Industry.
Our technically trained engineers have an unusual amount of scientific knowledge on the subject of oil seals and applications, at their command.
The opportunity of finding out what Milpaco Oil Seals are, and what they actually do in service, is yours for the asking. Just have one of our engineers call. Your time will be spent profitably.
MICHIGAN LEATHER PACKING CO.
720 Fourteenth Avenue, Detroit
S-103
ACHIEVEMENTS

"It's BACKBONE" that Counts in Crane Operation

Rigid girder construction decides largely how your crane stands up under long years of hard service. The distortion or weaving that results from inability to carry stresses means ultimate crane failure.

In P&H Crane Girders, ALL common causes of material "stretching" due to punching have been eliminated. All rivet holes are drilled . . . perfectly aligned. It's modern advanced equipment and single manufacturing responsibility that give you these extra features at no higher cost.

Harnischfeger engineers offer you a wealth of experience in material handling application. Bulletin 450 will give you the story of P&H Cranes. Write for it.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H TRAVELING CRANES

S. C., and Puget Sound, Wash., 35 tons each. Material is included in schedule 6115, bureau of supplies and accounts, navy department, Washington. The same inquiry calls for 110 tons of narrow strip steel, same yards.

Youngstown, O.—Steel bar orders and specifications are exceeding the September volume and district mills are operating at fairly satisfactory rates on this business, coming from a wide variety of sources. Shipments are so steady as to preclude more than a couple of weeks' rollings as a backlog.

Plates

Plate Prices, Page 64

Pittsburgh—Requirements of the Fort Peck dam on pontoon, discharge, and land pipe are attracting considerable bids from the Pittsburgh district. Treadwell Construction Co., Midland, Pa., is low on bids opened Sept. 30 at $64,171.91 for 414 28-inch welded pontoon pipe sections, some of which are made of $\frac{3}{4}$-inch plate. The local plate market has been featured recently by award of American Barge Lines, Louisville, Ky., to McClintic-Marshall Corp., Bethlehem, Pa., of eight 175 x 31 x 11-foot steel barges equipped with tanks, work on which has been commenced at Leetsdale, Pa. Due to considerably heavier orders, Midland Barge Co., Midland, Pa., has constructed an extension to its marine ways. Midland Barge Co. is also working on a sand and gravel dredge hull for the Madison Coal & Sand Co., Madison, Ind., and one steel barge for the Parson & Rader Transportation Co., Zanesville, O.

Cleveland—Plate specifications are averaging better than in the preceding nine months this year, with considerable diversity in demand. For Great Lakes cargo vessel rehabilitation work, including the reboilering of a number of boats, 2000 to 3000 tons are active.

Chicago—Plate specifications are increasing slowly. Most betterment comes from structural fabricators, though producers of tanks and other fabricated plate products are slightly more active. Industrial tank work, while still quiet, has gained gradually during the past several months.

Boston—Miscellaneous industrial demand for plates is steady, volume being made up largely of numerous small orders for prompt delivery. Shipyard requirements are heavier. Several small tanks for Eastport, Me., have been placed, larger units going to Pittsburgh-Des Moines Steel Co. About 100 tons of plates are required for a central power plant, state

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Ask for Bulletin RH-2

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H MILWAUKEE ELECTRIC HOISTS

prison, Howard, R. I. Plate prices are unchanged at 2.22c, Boston.

New York—Award of the navy cruiser on which bids were opened recently to the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., will later mean the placing of a substantial tonnage of plates through local offices, as the company's purchasing department is located in New York. The cruiser will require approximately 6500 tons of steel, of which about two-thirds will be plates, it is said. Miscellaneous plate tonnage still lags.

About 15,000 tons of hull steel will be required for a new liner for which the International Mercantile Marine, Roosevelt Steamship Co. has just filed plans in Washington for which Gibbs & Cox Inc., 1 Broadway, New York, engineer, will take construction bids in a few weeks. It will be a sister ship to the MANHATTAN and WASHINGTON but slightly larger. About 1200 tons of steel each will be required for three streamlined ferryboats for the bureau of plants and structures, New York, to be built with $3,000,000 PWA funds. Repairs to the Morgan liner DIXIE, recently noted, will require close to 400 tons of plates. Bids for repairs will be asked within a week or so. Snead & Co., Jersey City, N. J., having placed 1175 tons for columns with Fort Pitt Bridge Works, Pittsburgh, for shelving for the library of congress is expected to place additional orders shortly for 2100 tons of plates and sheets and about 900 tons of small shapes.

Philadelphia—Buying of plates is still slow, although the navy has two or three schedules up for opening over the next several days. Apparently, only one lot, however, is for shipment into this district, this involving 357 tons, with 145 tons of sheets, for opening Oct. 22. A portion of this material will be galvanized. Prices generally are unchanged.

San Francisco—Plate awards aggregated 940 tons, bringing the total for the year to 38,815 tons, compared with 56,554 tons for the corresponding period in 1934. Unnamed interests secured 300 tons for a pipe line at Mahukona, T. H. Bids have been opened on 900 tons for siphons for the city of Denver. Pipe will be taken on a portion of the line.

Seattle—Bids will be taken Oct. 18 by the board of contracts, Tacoma, Wash., for 19,450 feet of steel water pipe, concrete gate house and appurtenances. Specifications call for 7370 feet of 52-inch 5/16 steel plate pipe, alternate for centrifugally spun concrete, and the balance of 5/16 or 3/8-inch steel plate pipe. Diameters range from 42 to 58-inch. Tonnage involved is approximately 1800 tons. The improvement is for the Green river municipal system.

Contracts Placed

2000 tons, eight 175 x 31 x 11-foot steel barges equipped with tanks, for American Barge Lines, Louisville, Ky., to McClintic-Marshall Corp., Bethlehem, Pa.

1325 tons, three 118,000-barrel tanks, Texas Empire Pipe Line Co., Wilmington, Ill., to Petroleum Iron Works Co., Sharon, Pa.

300 tons, pipe line, Mahukona, T. H., to unnamed interest.

120 tons, tanks, Lieber Brewing Co., Indianapolis, to unstated interest.

100 tons, 20-inch pipe, United States engineers, Los Angeles, to unnamed interest.

Unstated tonnage, two 118,000-barrel tanks, Sun Oil Co., Nederland, Tex., to Chicago Bridge & Iron Works, Chicago.

Unstated tonnage, 50,000-gallon standpipe, Harrodsburg, N. Y., to W. E. Caldwell Co., Louisville, Ky.

Contracts Pending

2835 tons, mainly medium black, bureau of supplies and accounts, navy department, Washington, bids Oct. 15, schedule 6088; delivery 1890 tons, Portsmouth, N. H. (Kittery, Me.), two submarines; 945 tons, Mare Island, Calif., one submarine; schedule also calls for 120 tons, medium black and galvanized sheets, 80 tons, Portsmouth, N. H., 40 tons, Mare Island.

2480 tons, black and galvanized, bureau of supplies and accounts, navy department, Washington, schedule 6108, bids Oct. 22; Boston, 705 tons; Norfolk, 705 tons; Philadelphia, Charleston, S. C., and Puget Sound, 357 tons each; same schedules includes 1015 tons medium black and galvanized sheets; Boston and Norfolk, 290 tons each; Philadelphia, Charleston and Puget Sound, 145 tons each; material is for destroyers to be built at navy yards, stations named.

1800 tons, Tacoma, Wash., Green river system improvement and replacement; bids Oct. 18.

1200 tons, six 175 x 26 x 11-foot barges, for Campbell Transportation Co., Pittsburgh, to McClintic-Marshall Corp., Bethlehem, Pa.

800 tons, 414, 28-inch welded steel pipe sections, partly of 3/8-inch plate, Fort Peck dam dredges, to Treadwell Construction Co., Midland, Pa., at $64.-171.94.

400 tons, four steel dump scows, for federal engineers, Pittsburgh; bids postponed from Oct. 12 to Oct. 26.

335 tons, half corrosion-resisting steel plates and half nickel-clad steel plates, bureau of supplies and accounts, navy department, Washington; bids Oct. 18, schedule 6173.

300 tons, 1,000,000-gallon elevated tank and tower, Newport News Waterworks commission, Newport News, Va., to be erected at Phoebus, Va.; bids Oct. 14.

225 tons, two 2000,000-gallon elevated water tanks, Daytona Beach, Fla., bids Oct. 11.

Unstated tonnage, tank and tower, government camp, All-American canal, Yuma, Ariz.; Chicago Bridge & Iron Works, Chicago, low; bids Sept. 26.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh—Cold-finished steel bar producers find difficulty in building up order backlogs because heavier automotive specifications now at hand practically all demand immediate shipment. The rate of cold-drawn bar buying by farm implement manufacturers and others has not diminished. Producers continue to quote 1.95c, Pittsburgh, as the cold-drawn carbon bar base, and 2.95c, for the alloy cold-drawn base.

Sheets

Sheet Prices, Page 64

Pittsburgh—Largely due to miscellaneous demands, sheet bookings in the week were the heaviest of any week since February. Automotive sheet demand is improving but not yet up to expectations. Production of common black and galvanized sheets is at about 70 per cent, full finished at 60 per cent, and jobbing mills at 50 per cent. The edge has definitely been taken off galvanized sheet buying in view of the jobbers' price change Oct. 1. Most jobbers stocked fairly heavily prior to the advance. Pittsburgh base prices are 2.40c for black sheets, 1.85c for heavy hot rolled, 2.50c for No. 10 gage cold rolled, and 2.95c for No. 20 gage cold rolled. Galvanized sheets are 3.10c, base, for No. 24 gage.

Cleveland—Demand for sheets is the most active in the finished steel market here, automobile manufacturers gradually increasing their specifications; refrigerator, washing machine and barrel manufacturers also taking larger tonnages. The Cleveland mill is operating close to capacity, and a nearby lake mill is at 60 per cent.

Chicago—Releases from automotive interests are heavier and with demand from other consumers well sustained, production continues at a fairly high rate. Further improvement in automotive needs is expected when several motor car builders attain schedules planned for the next several weeks. While smaller sheet consumers are placing small individual lots, ordering is fairly frequent. Little contracting is being done for the balance of the year, though current prices are steady.

Boston—Industrial demand for sheets is steady, with specifications for miscellaneous needs sustained, notably heavier gage of blue annealed. Jobbers, however, have done little new buying since the opening of the quarter. Cold-finished is moving moderately well.

New York—Sheet tonnage is moving well, except possibly galvanized on which jobbers covered substantially last month before the elimination of the jobber differentials. Due primarily to the improved automo-

tive demand in the Middle West, district sellers here report advancing deliveries on cold rolled sheets, particularly wider sizes. At present these deliveries range around four weeks. Prices are unchanged.

Washington—More than 1000 tons of sheets are required for 12,655 steel clothes lockers for delivery at various army posts. Low bidder, lump sum, was Lyon Metal Products, Aurora, Ill., $87,673.06 f.o.b. factory, or $100,322.55, f.o.b., post. All Steel Equipment Co. Inc., Aurora, Ill., bid $88,025.22, factory, and $100,674.70, post, while Berger Mfg. Co., Canton, O., bid $89,158.56, factory, and Penn Metal Corp., Baltimore, quoted $98,896.52, delivered posts. Contract has not yet been awarded and it is likely several will share in the award. Bids closed Sept. 27.

Buffalo — Sheet mills are operating at 80 per cent. New orders assure continued high production. District mills will produce close to 10,000 tons of sheets this month.

Philadelphia — Miscellaneous sheet demand so far this month has been at a higher rate than for September. Particularly good buying still is being done by stovemakers. Radio manufacturers are specifying freely. Bids were opened Oct. 11 by Maryland on 320 tons of license tag stock. The sheets are 31¼ x 93¾ inches, No. 22 gage.

Youngstown, O. — The volume of new bookings of sheets has continued to increase through October, substantially exceeding those for the like period in September. Automotive builders are increasing demands by enlarged specifications. To these are being added further sheet requirements from refrigerator, steel barrel and other like consumers of flat-rolled products. Shipments continue to show satisfactory movement from producing mills.

Cincinnati — Specifications from automobile manufacturers are heavier and rolling schedules have been advanced close to 80 per cent. Other demand is broad and close to previous levels.

Birmingham, Ala. — Mills are maintaining an active rate of production and shipments are steady.

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Transportation

Track Material Prices, Page 65

Award of 21,842 tons of rails by the Chesapeake & Ohio recently has extended active schedules of rail mills in the Chicago district. Rolling by some other recipients of tonnage from this road have not been started but delivery of the entire tonnage probably will be made before the close of the year. This rail purchase was accompanied by distribution of more than 1000 tons of track fastenings. Little rail inquiry is current but the Norfolk & Western is expected to place its inquiry soon for 40,000 tons, of which 15,000 tons is for 1935 delivery.

Chicago & North Western has placed 2400 tons of rails with Carnegie-Illinois Steel Corp.

Lehigh Coal & Navigation Co., Philadelphia, is in the market for 60 to 100 mine cars.

General steel buying for repair and similar purposes is in small lots and track accessories are also in light demand.

New York Central has not distributed its fourth quarter steel requirements on which bids were opened Sept. 26. On bids for billets at this opening one eastern mill is reliably reported to have waived the $3 increase generally effective for fourth quarter. New axle extras continue to receive unfavorable comment among buyers, with some extras aggregating $18 over old extras.

Car Orders Pending

Lehigh Coal & Navigation Co., Philadelphia, 60 to 100 mine cars, bids asked.

Pipe

Pipe Prices, Page 65

Pittsburgh—Tube mill operations in this district have advanced fractionally to 45 per cent, based on a slightly better volume of small-lot business. Much of the latter is traceable to oil country goods, and there is also a fair demand for boiler tubes. Standard pipe is still relatively slow and there is virtually no activity in line pipe as far as projected business nearing the contract stage is reported. Discounts on all tubular products are steady.

Cleveland — WPA is functioning more actively, resulting in some substantial orders for cast pipe from municipalities. Sandusky, Akron and Macomb, O., placed orders aggregating 825 tons, and smaller lots from other towns brought the total for the week booked here to around 1800 tons. Inquiry is heavier than in several months.

Chicago—Cast iron pipe is slightly more active, more requests for bids being received from smaller municipalities which have obtained federal loans for proposed work. While no large increase in bookings is in early prospect and unfavorable weather for pipe laying is approaching, the outlook is seen as somewhat more promising. Orders still are light individually and collectively. Among the largest of new inquiries is 1050 tons for Duquoin, Ill.

Boston — Uniform prices were quoted by four bidders for the supply of corrugated metal pipe culverts for use in the federal highway projects in Maine, diameters 12 to 48-inch. A substantial tonnage is required with the award still pending. Drive and casing pipe in connection with the tidal power project, Eastport, Me., went to McDowell Pipe Corp., Brooklyn. Merchant steel pipe demand is slightly heavier. Cast pipe buying is sluggish with inquiry light.

New York—Lacking large volume inquiry, cast pipe is slightly more active, purchases including 1300 tons for WPA projects, two foundries to furnish the material. Prices on this inquiry were firm, pipe being cement-lined. Small-lot buying is slightly heavier. Utilities are inactive. The next purchase by New York city will be for 800 tons, bids expected later this month.

San Francisco—Demand for cast pipe on the Pacific Coast continues at low ebb, less than 1000 tons being in sight.

Seattle—A. Langguth, 604 Concord building, Portland, Oreg., will open bids Oct. 17 for the Corbett, Oreg., water system. This includes a 200,000-gallon concrete reservoir, 36,000 feet of 3 to 8-inch water pipe and accessories, and a crib dam. Mosier, Oreg., will open bids Oct. 16 for a water system.

Cast Pipe Placed

1300 tons, 20-inch and under, cement-lined, procurement division, treasury department, New York, 1000 tons to United States Pipe & Foundry Co., Burlington, N. J.; 300 tons to Donaldson Iron Works, Emaus, Pa.

250 tons, 6 and 8-inch, water line extension, near New London, Conn., to Donaldson Iron Works, Emaus, Pa.

225 tons, water line, Sandusky, O., to James B. Clow & Sons, Chicago; public works project.

225 tons, water line, Macomb, O., to James B. Clow & Sons, Chicago; public works project.

350 tons, water line, Akron, O., to James B. Clow & Sons, Chicago; WPA project.

150 tons, resettlement project, Hightstown, N. J., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 10-inch, sewer, Mamaroneck, N. Y., to Donaldson Iron Works, Emaus, Pa.

100 tons, Colonie, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

1050 tons, various sizes, Duquoin, Ill.

850 tons, 14-inch, with hydrants, valves and fittings, water works improve-

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ments, Daytona Beach, Fla.; bids in.
600 tons, 8-inch, District of Columbia, United States Pipe & Foundry Co., Burlington, N. J., low.
125 tons, Sparlmand, Ill.
100 tons, small sizes, sewer and water system, Angier, N. C.; bids in. Also 100,000-gallon elevated water tank.
Unstated tonnage, 2000 feet, cast iron soil pipe, also 41,000 feet, small sizes, welded steel pipe, United States engineer, Eastport, Me.; bids Oct. 15.

Ralph M. Parsons Co. has moved its main offices from Mt. Vernon, O., to 310 South Michigan avenue, Chicago. The company specializes in the design and construction of oil cracking and refining units.

Shapes

Structural Shape Prices, Page 64

New York — With approximately 30,000 tons bid or being figured to close within the next three weeks, structural steel is the most active in more than two years. Potentially, a tonnage of 80,000 tons is on the boards and likely to come out before the close of the quarter, almost entirely public works. New inquiry includes more than 2000 tons for the New Jersey approach, Hudson midtown tunnel, including 1720 tons structural tunnel lining; 8000 tons, New York city schools, closing Oct. 15 and 21; about 5000 tons, additional buildings, Brooklyn college, Brooklyn, N. Y., while 12,000 tons for an elevated highway section is expected out daily. Awards also are heavier at about 5000 tons.

Pittsburgh — In addition to being low on a 182-ton McKean county bridge, Graham Construction Co., Lancaster, Pa., on Oct. 4 bids, is low on a 219-ton steel truss bridge, Centre and Clinton counties, Pennsylvania. In the same letting, Carl R. Camp Inc., Philadelphia, is low on replacing a bridge floor in Lewisburg borough, Northumberland and Union counties, taking 87 tons of plain structural steel and 25,823 square feet of steel channel bridge flooring.

Cleveland—An increase in the number of small-lot inquiries and orders for plant expansions features the market. For an industrial building at LaPorte, Ind., 150 tons are required. Bids will be taken Oct. 17 on 300 tons for a screening and other buildings, contract No. 88, easterly sewage disposal plant, Cleveland. Awards include 112 tons for a garage, Hollenden hotel, Cleveland.

Chicago—State bridges predominate new inquiries, about 3500 tons being involved in small structures in various western states. Lock and dam work in Alabama and Tennessee will take 3000 tons. Awards are considerably below the average of previous weeks, being headed by 1600 tons for a Chevrolet Motor Co. building at Indianapolis.

Boston — Structural inquiry is gaining momentum, a school closing at Providence, R. I., this week taking close to 1000 tons. Awards still are light, but the gradual completion of plans and financing for public works projects indicates a substantial early improvement.

Philadelphia — Structural activity here is slow. Bids on the 2300-ton Archives building, Washington, have been rejected. Leading shape mills have adopted a new method of quoting plain material on identified structures. According to this, the

Behind the Scenes with STEEL

Congress Adjourns

THOUGH ten days have elapsed since the Metal Show drew to a glorious close in Chicago, highlights of the affair still will bear repetition.

Nearly 30,000 streamed through the doors of the International Amphitheatre, despite the fact that it was a long jaunt from the Loop, and in an atmosphere that was anything but in harmony with industrial expositions. Fortunately a stiff lake breeze kept most of that delightful stockyards aroma back off the scene.

Exhibitors outdid themselves in the matter of striking displays. Operating models, splashings of color and lights, acres of modernistic furniture, animated display boards, hundreds of thousands of products of the metal industries, kept visitors goggle-eyed.

We heard a report going around early in the week that Miss Joan Crawford [of the moving pictures] was going to be on hand with her escort, Mr. Franchot Tone, the latter's father being head of the Carborundum Co.—a prominent exhibitor. We kept looking around all the corners while we were there, but she didn't show up. Someone said she had another appointment and couldn't get to the show. We don't know.

Looking in on several of the technical sessions, heavy crowds seemed to be the rule. And when those technicians get to talking and showing pictures on the screen they don't fool. The air got too thick with sorbitic troostite and rampant austenite for our meager mind. But we noticed that in every meeting, right down there in a front row, sat a STEEL editor with notebook and pencil, listening intently; the result being the complete reports of the congress and exposition which you saw first in last week's issue, pp. 14, 15, 16, 17, 38-44; and more in this week's issue, pp. 45-52.

* * *

Goings On

IF IT were not for the fact that we discovered the other day there are a few women readers of this column (do we get around!) we might give a full report of that Wire Association dinner in Chicago. Of course, we only heard about it second-hand; they wouldn't let us in—too young. We went out to a nearby whoopee parlor and cried big tears in a small glass of ale.

* * *

Mail

MAILMEN are still trudging from STEEL'S offices every morning with heavy sacks containing copies of the Machine Tool Show and Metal Show numbers, many requests being received for extra copies of these issues. Our mailroom chief also reports a steady stream of those handy four-way hardness conversion charts going out to progressive metallurgists around the country. What! You haven't heard about them? Refer to Sept. 23 issue, insert between pp. 52 and 53. Do you need one for your office? Send us a quarter instead of putting it in that slot machine and we will mail a chart to you, flat. Any number over one, 10 cents each. Postpaid, the last can.

* * *

More Mail

MANY interesting missives are found among incoming mail, too. Such as this, reproduced in part from a letter sent by the president of a Rochester, N. Y., manufacturing company:

". . . It has always been our practice to circulate magazines of interest to our executives and department heads and there is considerable interest in your magazine STEEL. You may therefore enter our subscription . . ."

* * *

Obit—

THE day that wreckers started dismantling the old Newburg works of American Steel & Wire in Cleveland also saw a covey of newspaper sobsisters and brothers descend on the scene to compose wistful sonatas of despair as the old plant succumbed. One touching composition appeared recently in a Cleveland newspaper. If you have tears, prepare to shed them now:

Once upon a time there was a giant. His muscles were ingots of steel. Through his veins ran cherry-red rivers of molten ore. Saffron flames spouting from his nostrils seared and illuminated the sky.

The whims and industry of the giant were tended by many little men. They swore and sweated in the heat that blistered their bodies and withered their souls.

. . . . . But years have passed. Sentiment and oaths and the giant himself have all been dumped into the melting pot of progress. The steel muscles have turned to rust. Ore dust, fine grittty, now fills the withered veins. The pillars of fire have died.

Gad, Twombly, old chap, we can't go on! Ingot muscles . . . molten-ore rivers . . . saffron flames . . . withered souls . . . ore dust, fine grittty. Tsk-tsk.

—SHRDLU

Shape Awards Compared

	Tons
Week ended Oct. 12	26,170
*Week ended Oct. 5	18,755
Week ended Sept. 28	28,550
This week, 1934	15,481
Weekly average, 1934	16,284
Weekly average, 1934	16,174
Weekly average, September	16,725
Total to date, 1934	701,106
Total to date, 1935	679,325

*Revised

ruling states in no case should the billing price of material at ultimate destination or the cost of material delivered at place of fabrication, resulting from an estimated price delivered at ultimate destination, be less than the so-called true price, f.o.b. fabricator's shop.

Buffalo — Structural demand is improving steadily. Bids on the high-level bridge over the Buffalo harbor are to be taken as speedily as specifications can be completed. The Buffalo postoffice is to be bid this month, these two jobs involving close to 10,000 tons of steel.

Birmingham, Ala. — Fabricating shops are receiving numerous small contracts, and have plenty of work in hand. Steel for several grade eliminations and bridge projects in Alabama and adjoining states has been placed.

Second partial grade crossing program for Alabama, approved by state authorities and expected to be advertised through individual projects shortly, requires 3200 tons of structural steel, 3400 tons of reinforcing bars and 225 tons of wrought iron. The Florida Atlantic-Gulf canal, on which first excavation bids are now being taken, will take a large tonnage of structural and other steel, the work to include four spillway dams and 12 bridges.

San Francisco—Structural awards were the largest for any week of the year and aggregated 22,289 tons. To date this year 105,217 tons have been booked, compared with 105,160 tons in the same period in 1934. Pacific Coast Steel Corp., San Francisco, booked 5500 tons for a transmission line for the metropolitan water district, Los Angeles, and 3300 tons of sheet steel piling for a bulkhead at Government Island, Oakland, Calif. Consolidated Steel Corp., Los Angeles, took 750 tons for an outfall sewer in Los Angeles. Pending business is not heavy, less than 5000 tons actually being up for figures. Aluminum Company of America booked 2000 tons of aluminum wire for the Los Angeles transmission system.

Seattle — Bids were opened Oct. 8 by United States engineer for the powerhouse superstructure at Bonneville, Oreg., dam, involving 400 tons. Two Washington state bridges are up for figures Oct. 15, while on Oct. 11, Montana will open bids for the Marias river bridge and two overpasses, requiring substantial tonnages.

Shape Contracts Placed

5500 tons, transmission towers, metropolitan water district, Los Angeles, to Pacific Coast Steel Corp., San Francisco.

3300 tons, piling, bulkhead at Government Island, Calif., to Pacific Coast Steel Corp., San Francisco.

2960 tons, assembly plant, Chevrolet Motor Co., Indianapolis, to R. C. Mahon Co., Detroit.

2250 tons, incinerator, 56th street and 12th avenue, department of sanitation, New York, to Ingalls Iron Works Co., Birmingham, Ala.; Rosoff Bros., New York, general contractors.

2600 tons, desilting basins, All-American canal system, Imperial dam, Yuma, Ariz., to Dorr Co. Inc., New York, at $564,800.

1200 tons, heating and gymnasium building, Brooklyn college, Brooklyn, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; E. Waters & Co., New York, general contractor.

1175 tons, book stack columns, Congressional library, Washington, to Fort Pitt Bridge Works, Pittsburgh.

875 tons, furnace building, New Jersey Zinc Co., Palmerton, Pa., to American Bridge Co., Pittsburgh. Tonnage of 275 tons is in addition to 600-ton award noted in STEEL, Oct. 7.

750 tons, White Point outfall sewer, Los Angeles, to Consolidated Steel Corp., Los Angeles.

550 tons, cableway towers, Fort Peck dam, Montana, to unnamed interest.

510 tons, grade crossings, Staten Island Rapid Transit Co., Tompkinsville and Stapleton, Staten Island, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; $30,498; bids Sept. 27.

500 tons, building, Needles, Calif., to

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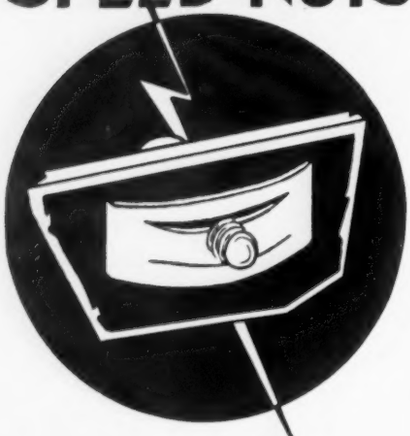

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Farm Equipment	Steel Furniture
Heating Elements	Stoves
Lamps (Auto)	Toys
Lockers	Vehicles (Children's)
Name Plates	Water Heaters
Oil Burning Units	
Refrigerators	

Tinnerman Stove & Range Co.

Speed Nut Division

CLEVELAND, OHIO

Wisconsin Bridge & Iron Co., Milwaukee.

450 tons, bridges, United States department of agriculture buildings, Washington, to Harris Structural Steel Co., New York; Viking Construction Corp., New York, general contractor, bids Aug. 13, $208,435.

420 tons, building additions, navy yard, Brooklyn, N. Y., to Harris Structural Steel Co., New York.

320 tons, piling, shipway, navy yard, Philadelphia, to Carnegie-Illinois Steel Corp., Pittsburgh.

315 tons, mail and service building, New York Central railroad, Syracuse, N. Y., to Shoemaker Bridge Co., Philadelphia; William Ballard Co., general contractor.

310 tons, bridge, Rangeville, Idaho, to Kansas City Structural Steel Co., Kansas City, Mo.

285 tons, plant building, Acme Steel Co., Riverdale, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

275 tons, court house, Conroe, Montgomery county, Texas, to Mosher Steel & Machinery Co., Dallas, Nathan Wohfeld, Dallas, general contractor.

265 tons, wharf, terminal project, Brownsville, Tex., to Alamo Iron Works, San Antonio, Tex.; J. DePuy, San Antonio, general contractor.

250 tons, bridge, Dubuque, Iowa, to Worden-Allen Co., Milwaukee.

215 tons, theater, Camden, N. J., to Belmont Iron Works, Philadelphia.

180 tons, bridge 194½, Chicago, Milwaukee & St. Paul railroad, Madison, Wis., to Worden-Allen Co., Milwaukee.

165 tons, bridge XI, 82 16-1, Detroit, to American Bridge Co., Pittsburgh.

160 tons, bridge, Grant county, Wisconsin, to A. C. Woods & Co., Rockford, Ill.

140 tons, state highway bridge, Bridgeport, Conn., to Fort Pitt Bridge Works, Pittsburgh.

135 tons, Good Shepherd church, New York, to Post & McCord Inc., New York; through McMahon-McEntegart Inc.

130 tons, bridge alterations, including deck, Stratford avenue, Bridgeport, Conn., to Fort Pitt Bridge Works, Pittsburgh.

130 tons, school, North Syracuse, N. Y., to Gray Steel Corp., Syracuse, N. Y.; Kraft-Detor Co., Syracuse, general contractors. Kalman Steel Corp., Bethlehem, Pa., awarded 39 tons of bar joists and reinforcing.

120 tons, state highway bridge, West Oneonta, N. Y., to American Bridge Co., Pitsburgh.

112 tons, garage, Hollenden hotel, Cleveland, to Republic Structural Iron Works, Cleveland.

110 tons, building, Borden Dairy Co., Brooklyn, N. Y., to Harris Structural Steel Co., New York; through H. B. McCaffrey Co.

105 tons, building, Sherwin-Williams Co., Bound Brook, N. J., to Rogers Structural Steel Co., Corry, Pa.; H. K. Ferguson Co., Cleveland, general contractor.

103 tons, shapes and bars, state highway bridge, Polk county, Arkansas, to Capitol Steel Co., Little Rock, Ark., E. B. Mooney, Hot Springs, general contractor.

100 tons, freight depot for Santa Fe railroad, Oakland, Calif., to Moore Drydock Co., Oakland.

100 tons, state highway bridge 3632, West Main street, highway 5664, Fredonia, Chautauqua county, New York, to R. S. McManus Steel Co., Buffalo; C. E. Knowles Co., Gowanda, N. Y., general contractor.

100 tons, bridge, Dartmouth, Mass., to Boston Bridge Co., Boston, through B. F. Construction Co.

100 tons, shapes and bars, postoffice, Torrington, Conn., to New England Iron Works, Hamden, Conn., and bars to Concrete Steel Co., New York; through Smith Construction Co., Derby, Conn.

100 tons, shapes and bars, plant addition, Conde Nast Publications Inc., Greenwich, Conn., to Topper & Griggs, Hartford, Conn., Bethlehem Fabricators Inc., Bethlehem, Pa., to fabricate. Bars to A. E. Bounty Co., Stamford, Conn. Bruono Construction Co., Stamford, general contractor.

Shape Contracts Pending

7500 tons, New York state highway bridges, including openings Oct. 15 and 29.

5000 tons, academic and science building, including greenhouse and pipe tunnel between gymnasium and science building, Brooklyn college, Brooklyn, N. Y.; bids Oct. 16, board of higher education, New York.

3300 tons, first section, Sixth avenue subway, Fortieth to Forty-seventh street, New York; George H. Flinn Corp., New York, low, $5,395,000, bids Oct. 4, board of transportation, New York.

3200 tons, second partial grade crossing elimination program, Alabama; first bids at Montgomery, Ala., shortly.

2350 tons, Andrew Jackson high school, Springfield, Queens, N. Y.; bids Oct. 21, department of education, New York.

2300 tons, addition, Archives building, Washington, on which McCloskey & Son, Philadelphia, general contractors, were low; bids rejected.

2014 tons, including 1720 tons, structural steel tunnel lining; 223 tons, roadway beams and 71 tons, curbs, base plates and cast steel, New Jersey approach and plaza, Midtown Hudson tunnel, Manhattan-Weehawken, N. J., bids Nov. 7, Port of New York Authority, N. Y. Alternates will be taken on tunnel lining, 1720 tons if project goes steel and 4150 tons, if cast iron segments are used.

2000 tons, lock, Sheffield, Ala.

1280 tons, roadway bridge, Wheeler dam, Alabama, for Tennessee valley authority, Knoxville, Tenn.

1125 tons, angles, channels, tees and I-beams, bureau of supplies and accounts, navy department, Washington; bids Oct. 15, schedule 6089, Delivery Brooklyn, N. Y., for one light cruiser.

1000 tons, public school 107, Seward avenue, Bronx, N. Y.; bids Oct. 21, department of education, New York.

1000 tons, Randalls Island junction, Triboro bridge, New York, Poirier & McLane Corp., New York, low, $2,144,830, contract 47, Oct. 10.

1000 tons, drum gates, Coal Creek, Tenn.

950 tons, Mount Pleasant avenue regional school, Providence, R. I.; bids Oct. 14.

850 tons, state bridges, Missouri.

630 tons, spillway bridge, Norris dam, Alabama, for Tennessee valley authority, Knoxville, Tenn.

500 tons, coke plant, Ford Motor Co., Dearborn, Mich.

500 tons, bridge, Chetopak, Kans.

432 tons, Panama, schedule 3097, bids Oct. 28, general purchasing officer, Washington.
Oct. 21, department of education, New York.

300 tons, screening and other buildings,

400 tons, tunnel, Columbus, O.
400 tons, bridge, Wakefield, Kans.
400 tons, bridge, Coal Creek, Tenn.
360 tons, plant addition, Davis Baking Co., Hoboken, N. J.
350 tons, Sixty-ninth street terminal addition, Philadelphia; John N. Gill, Philadelphia, awarded general contract.
350 tons, state bridges, Michigan.
348 tons, crossing at Salinas, Calif., for Southern Pacific Co.; bids opened.
300 tons, parcel post building, Worcester, Mass.; bids of Sept. 26, Tremeglio Bros., Waterbury, Conn., low, rejected. Project will be readvertised under revised plans and specifications.
300 tons, public school 247, Twenty-first avenue, Brooklyn, N. Y.
300 tons, easterly sewage disposal plant, contract No. 88, Cleveland.
250 tons, school, Whitney Point, N. Y.
250 tons, tunnel ribs, specification 131, metropolitan water district, Los Angeles; Youngstown Steel Car Corp., Niles, O., low.
219 tons, steel truss bridge, Liberty township, Centre and Clinton counties, Pennsylvania, Graham Construction Co., Lancaster, Pa., low bidder at $54,568.64. Project also includes 50,553 pounds of plain steel bars.
200 tons, bridge, Newport, Ky.
150 tons, industrial building, LaPorte, Ind.
140 tons, plant building, Clarksburg, W. Va., for Pittsburgh Plate Glass Co., Pittsburgh; bids in.
135 tons, special medium black tees, bureau of supplies and accounts, navy department, Washington, bids Oct. 15, schedule 6090. Delivery 90 tons, Portsmouth, N. H., two submarines; 45 tons, Mare Island, Calif., one submarine.
130 tons, shapes and bars, postoffice, Albert Lea, Minn.; C. M. Tapager Construction Co., Albert Lea, low, Oct. 8.
100 tons, replacing existing bridge floor, Lewisburg borough, Northumberland and Union counties, Pennsylvania; Carl R. Camp Inc., Philadelphia, low at $64,829.98.
100 tons, post office, Huntington, W. Va., Nov. 15.
Unstated tonnage, three-span bridge, one span 676 feet and two remaining spans, 260 feet, across the Ohio river, Sistersville, W. Va.; plans being considered by Huntington, W. Va., engineers with public hearing to be held at Huntington, Oct. 18.

Reinforcing

Reinforcing Bar Prices, Page 65

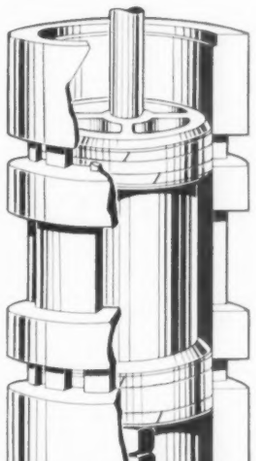
New York—New inquiry for reinforcing steel, which more than matches active buying, is led by 1400 tons, New Jersey approach, Hudson midtown tunnel, closing Nov. 7. Bids on the largest pending project, 5750 tons, Randalls Island junction, Triboro bridge, brought out a low of $2,144,830, Poirier & McLane Corp., New York, Oct. 10. More than 17,000 tons of bars and mesh are active.

Pittsburgh—In the Oct. 4 Pennsylvania state letting, Graham Construction Co., Lancaster, Pa., is low on work in Centre and Clinton counties, requiring 50,553 pounds of plain steel bars. Bids will be taken Oct. 18 by the state highway department on four reinforced concrete structures in Wyoming county requiring 69,963 pounds. Plain steel bars for reinforcing purposes are unchanged at 1.85c, mill, or 2.05c, base, Pittsburgh, quoted by distributors for carload quantities.

Cleveland—Small lots predominate in the market, mainly for public work. Fabricators are figuring on 300 tons for a dam at Akron, O., and 280 tons for the 140th street sewer ejector, Cleveland, bids Oct. 17.

Chicago—Few large lots of concrete bars are being placed, though substantial tonnages still are involved in pending work on which bids will be taken over the next several weeks. These include municipal sewage and filter plants, river locks and highway work. Ann Arbor, Mich., has closed on 325 tons for a sewage treatment plant there, while Chicago and Milwaukee have substantial lots pending for municipal construction.

Philadelphia—Outstanding in the local reinforcing bar market is the placing of 285 tons of bars for a shipway at the Philadelphia navy



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Astounding power savings, shown in comparative tests to be as large as 40%, with no sacrifice in the force of blow available, no impairment of the snappy blow that has made ERIE steam drop hammers for years the favorite of hammermen all over the world.—that is the tested-and-proved record of this ERIE Ring-type Motion Valve.

The ERIE ring-type valve is a perfected form of the motion valve used in ERIE hammers for many years. The piston valve is the only slide valve in which perfect balance is inherent in the design; no adjustment of the fit of the valve is necessary. It remained only to provide an automatic means of compensating for wear, and this has been accomplished by means of the four bronze rings which form the cutting edges. The spring of the rings maintains the steam-tight fit as wear occurs, and the whole mechanism can be renewed by replacing the four rings.

The bore of the bushing is finished by the honing process, giving a mirror-like, almost frictionless surface for the rings to contact. A new type of steam chest cover is provided, in which no packing is required. The valve stem is guided truly, but without friction. The duties of the maintenance man are simplified rather than made more complex. Never any adjustments; new hammer "pep" and economy by replacing rings every few years.

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yard, in addition to the award of 320 tons of steel piling. Bids were opened Oct. 11 on five Pennsylvania state road projects, involving 350 tons of bars and mesh. These projects are the first of 122 under a program of road construction in this state and involving an aggregate of approximately 5000 tons of road steel.

Boston — Reinforcing steel buying is heavier, principally for public work. The Boston district mill booked 350 tons for an underpass.

Birmingham, Ala. — An order for 560 tons of reinforcing steel was placed by the Virginia Engineering Co., of Newport News, Va., for constructing barracks at the United States naval station, Pensacola, Fla. Other smaller tonnages also were booked, and production is steady.

San Francisco — Awards were the third largest for any week of the year and totaled 6982 tons, bringing the aggregate for the year to 187,670 tons, compared with 90,842 tons for the same period a year ago. California Hardware Co. booked 3741 tons for the United States engineers, Los Angeles. Colorado Fuel & Iron Co. secured 1054 tons for the new San Francisco mint.

Seattle — Increasing construction, particularly by private interests, is reassuring to producers of reinforcing bars. While immediate demand has not improved, some sizable tonnages are involved in contemplated grade crossing projects planned in the Pacific Northwest, especially Montana and Oregon. These jobs are not yet out for figures but are assuming form. Montana will open bids Oct. 11 for 14 projects including a 360-foot, 3-span overpass in Fallon county and a steel and concrete bridge, 1151 feet in length, over the Marias river, Choteau county.

Reinforcing Steel Awards

3741 tons, United States engineers, Los Angeles, to California Hardware Co., Los Angeles.

1900 tons, procurement division, treasury department, New York, WPA projects, divided to Truscon Steel Co., Youngstown, O.; Concrete Steel Co., New York; W. Ames Co., New York; Igoe Bros., Newark, N. J.; Carroll and Julius Oehrlein Inc., Bronx, N. Y.

1635 tons, specification 110, metropolitan water district, Los Angeles, to unnamed interests.

1054 tons, mint, San Francisco, to Colorado Fuel & Iron Co., Pueblo, Colo.

971 tons, station hospital, Fort Sam Houston, Texas, to Concrete Engineering Co., San Antonio, Tex.; Robert E. McKee, El Paso, engineer and general contractor. Weaver Inc., Dallas, Tex., awarded 40 tons of structural steel.

350 tons, bridges, underpass and approaches, South Huntington avenue, near Riverway and Brookline village, Boston, to Northern Steel Co., Boston; Coleman Bros. Corp., Boston, general contractor, $344,891.

325 tons, sewage treatment plant, Ann Arbor, Mich., to Concrete Steel Fireproofing Co., Detroit.

285 tons, shipway, navy yard, Philadelphia, to Joseph T. Ryerson & Son, Inc., Chicago.

265 tons, highway route No. 25, section 23, Burlington county, N. Y., to Igoe Bros., Newark, N. J.; through P. Camillo Co., Westfield, N. J.

250 tons, rail steel bars, previously noted as placed with an unnamed seller, for terminal development in Camden, N. J., for South Jersey port commission, that city, to Concrete Steel Co., New York

250 tons, custom house, Denver, Colo., to Kalman Steel Corp., Bethlehem, Pa.

165 tons, post office, Bronx, N. Y., to Concrete Steel Co., New York; through Cauldwell-Wingate Co.

150 tons, highway, Croton, Conn., to American Steel & Wire Co., New York; through New Haven Roads Construction Co.

124 tons, paving in three counties in Arizona, to unnamed interests.

110 tons, gymnasium and heating buildings, Brooklyn college, Brooklyn, N. Y., to Joseph T. Ryerson & Son Inc., New York; through E. Waters & Co.

100 tons, Fitch bridge—Elmira highway No. 46, Chemun county, New York, to Wickwire Steel Co., New York; through John H. Bolton, Watkins Glen, N. Y.

Concrete Awards Compared

	Tons
Week ended Oct. 12	11,675
Week ended Oct. 5	2,550
Week ended Sept. 28	6,493
This week, 1934	4,740
Weekly average, 1934	4,084
Weekly average, 1935	6,706
Weekly average, September	28,497
Total to date, 1934	194,273
Total to date, 1934	281,676

Reinforcing Steel Pending

5750 tons, Randalls Island junction, Triboro bridge, New York, Poirier & McLane Corp., New York, low, $2,144,830, contract 47, Oct. 10.

3400 tons, second partial grade crossing program, Alabama, first bids at Montgomery, Ala., shortly. Works also include 225 tons wrought iron.

2800 tons, intercepting sewers, Manhattan and Bronx, New York, in connection with Ward's Island sewage disposal plant; general contracts awarded Rosoff Bros., and Rodgers & Hagerty Inc.

1400 tons, New Jersey approach and plaza, Midtown Hudson tunnel, Manhattan-Weehawken, N. J.; bids Nov. 7, Port of New York Authority, N. Y. Mesh requirements depend on tunnel lining alternates, 47 tons if steel, 33 tons if cast iron.

1100 tons, San Pablo avenue crossing, Oakland, Calif.; bids opened.

1050 tons, air fleet base, Pearl Harbor, T. H., specification 7474; bids Oct. 16.

475 tons, 57,000 squares, noncorrosive wire fabric, United States engineer, Vicksburg, Miss., schedule 86, bids Oct. 18.

350 tons, five road projects for state of Pennsylvania, bids opened Oct. 11; these projects are the first of 122, previously noted, as involved in federal aid road program in the state, requiring a total of approximately 5000 tons of bars and mesh.

300 tons, also 70 tons of piling, dam, Akron, O.

280 tons, 140th street sewer ejector, Cleveland; bids Oct. 17.

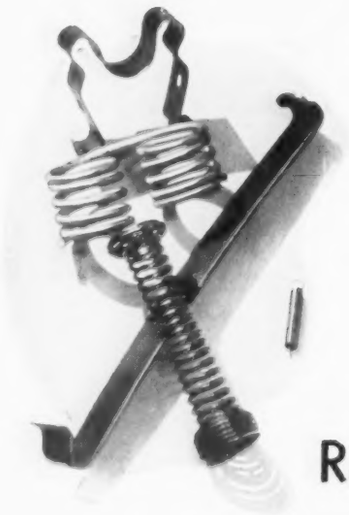
252 tons, underpass structures, Williamsburg, Va., bureau of public roads, department of agriculture, Washington; bids Oct. 17.

250 tons, first section, Sixth avenue subway, Fortieth to Forty-seventh street, New York; George H. Flinn Corp., New York, low, $5,394,000, bids Oct. 4, board of transportation, New York.

234 tons, Marias river bridge, Chouteau county, Montana; bids Oct. 15.

RAYMOND

Springs



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A modern up to date plant—the use of high grade materials and careful heat treatment *plus* Raymond experience should be able to—and can—end your spring troubles.

Let us help you with the proper spring design—and let us quote you on your requirements.

Raymond Mfg. Co.

Corry, Pa.

164 tons, crossing in Lewis & Clark county, Montana; bids Oct. 15.

150 tons, building, Sherwin-Williams Co., Bound Brook, N. J.

105 tons, highway projects, routes 18 and 26, Allegheny county, North Carolina, bids Oct. 24 and 31, department of agriculture, bureau of public roads, Washington.

Strip Steel

Strip Prices, Page 65

Pittsburgh — More numerous orders from the automobile industry have been placed over the last week, giving strip makers heavier backlogs than they had Sept. 15. The gain in strip activity is more noticeable in cold-rolled and stainless grades where operations are at around 50 per cent. Hot-rolled production remains unchanged at the 40 per cent level. Base prices are firm, finding the hot-rolled Pittsburgh base, 1.85c, and the cold-rolled strip price, 2.60c.

Cleveland—General Motors and Chrysler units have specified fairly substantial shipments for this month, increasing mill backlogs moderately. Miscellaneous requirements are fair.

Chicago—Strip demand is steady. While some improvement is noted in automotive releases, the volume still is not up to expectations. Miscellaneous consumers are taking shipments at an even rate, though buying generally is restricted to relatively early needs. Prices are steady.

Boston — Cold strip volume continues to increase with general industrial, stamping and automobile accessory producers taking steady shipments. Most orders are for immediate delivery. For destroyers and submarines being built at the Boston and Portsmouth, N. H., navy yards a substantial volume of strip, narrow widths, is being figured. Prices on the general run of business are steady at 2.80c, Worcester.

Philadelphia—Apart from continued good specifications from radio manufacturers, the local strip market is featureless. Volume as a whole is fairly well sustained, however. Hot strip is unchanged at 1.85c, Pittsburgh, or 2.16c, Philadelphia, and cold strip at 2.60c, Pittsburgh, or 2.91c, Philadelphia.

Wire

Wire Prices, Page 65

Pittsburgh — Due to bookings prior to Oct. 1, wire producers in this district have fairly sizable backlogs through October and shipments this month will be considerably ahead of September. The improved rural outlook and appearance of automotive buying of manufacturing wire products both forecast an active market in November and December. Wire nails remain based at $2.40 per keg. Pittsburgh, polished staples, 3.10c, galvanized barbed wire, 2.80c, and annealed fence wire, 2.45c. The market on plain manufacturing wire holds at 2.30c and on spring wire, 2.90c.

Cleveland — Despite temporary slowing in the market for agricultural wire, total wire tonnage booked by producers here continues to increase, due to stronger demand from manufacturers. The latter shows considerable diversity, with bolt and nut makers and jobbers especially taking larger lots. Prices are firm.

Chicago—Demand for wire and wire products continues to improve gradually and production is moderately heavier than a month ago. While business in manufacturers' wire continues relatively more active than that for merchant products, jobbers are taking slightly larger lots.

Boston — Four Portland, Me., sellers were awarded equal shares in wire cable guard rail and fittings for public works highway projects, estimated at more than 100,000 feet. Awarded contracts were: Guard Rail Erectors Inc., The Boyd Corp., Cumberland Sales Co. and E. Corey & Co. Bids from 11 sellers were identical. Manufacturers' and specialty wires are in strong demand and mill operations are maintained. Spring wire buying holds steady.

San Francisco — Aluminum Co. of America, Pittsburgh, was awarded 2004 tons of aluminum wire for a transmission line for the metropolitan water district, Los Angeles, under schedule 2 at $614,316 and Anaconda Wire & Cable Corp., New York, secured several hundred tons of copper wire under schedule 3 at $37,841.

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—Even though both beehive and by-product coke prices have been advanced over the past ten days by from 25 to 50 cents a ton, pig iron producers give no intimation of an early price advance. Foundry iron continues $18.50, Pittsburgh district furnace, with bessemer $19, and basic $18. Absence of jobbing foundries in this district is keenly felt and other melters are still buying on an as-needed basis. Consequently, district pig iron suppliers are forced to maintain as many as 150 to 200 different analyses of iron on the ground in order to serve such a trade. Only the Shenango

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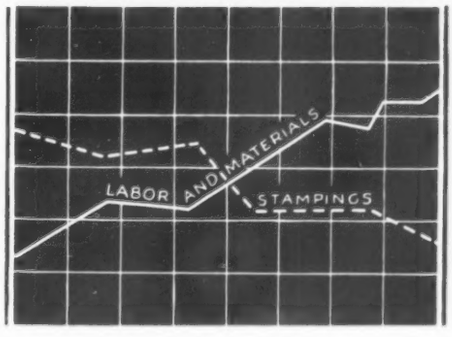

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Furnace Co. and Davison Coke & Iron Co.'s stacks in this district are active among the merchant group

Cleveland—Pig iron shipments continue to increase, being 23 per cent larger so far this month than in the comparable period of September. Automobile manufacturers are taking more material, as are the railroads for car repair. Makers of heating equipment, agricultural implements and machine tools are active. As about 90 per cent of the melters have closed for a considerable portion of their fourth quarter requirements current sales are in lighter volume. Prices are firm.

Chicago—Pig iron shipments are gaining gradually, aided by releases from some automotive parts suppliers which had suspended shipments for a short time. Most large consumers now have contracted for fourth quarter needs. Higher quotations are expected to be announced in the near future. The market currently is $18.50, furnace, for No. 2 foundry and malleable.

Boston—Pig iron sales, with few individual orders exceeding 200 tons, are more numerous and the aggregate volume during the last 10 days probably approached 2500 tons. This includes both domestic and foreign iron sales, the former at firm and unchanged prices, the latter moving 50 cents or more a ton less. Foundry melt is the heaviest in months and increasing, castings for the machine tool trade being in good demand. Imports at Boston in September were 2251 tons—803 Indian and 1448 Dutch. Since Oct. 1, however, heavy additional foreign shipments have arrived in New England.

New York—Inquiry for pig iron is featured by one for approximately 1000 tons of foundry iron. Generally speaking, however, recent demand has been off due to some fair contract buying prior to the beginning of this quarter. However, specifications are better, reflecting slightly broadening consumption. While an advance in this quarter is still a possibility, most trade leaders look for no change before the first of next year, notwithstanding the fact that production costs are advancing, due in part to higher fuel prices.

Philadelphia—While most sellers report a drop in new orders, shipments continue to expand due to releases against contracts placed last month. Riddlesburg, Pa., stack of Colonial Iron Co. is now expected to be blown in around Nov. 10.

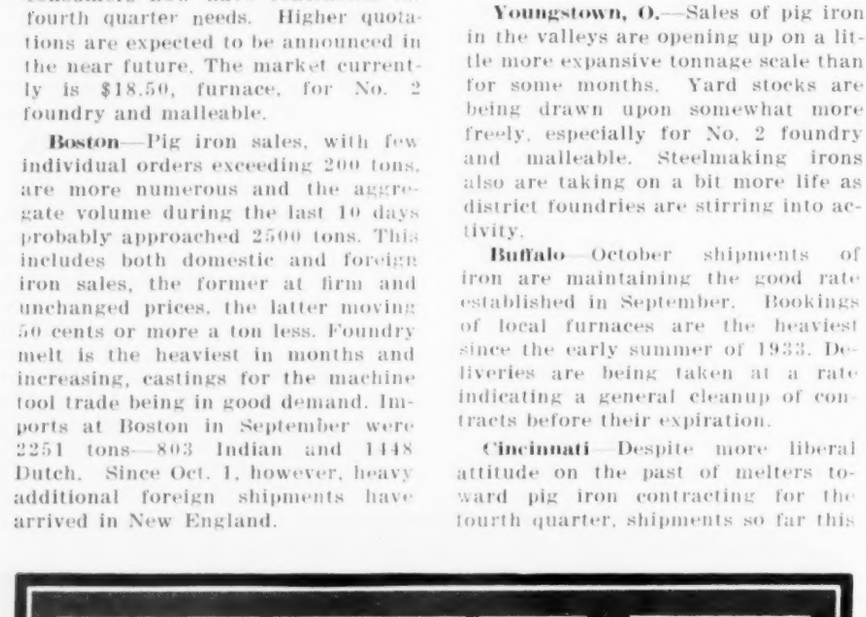
Youngstown, O.—Sales of pig iron in the valleys are opening up on a little more expansive tonnage scale than for some months. Yard stocks are being drawn upon somewhat more freely, especially for No. 2 foundry and malleable. Steelmaking irons also are taking on a bit more life as district foundries are stirring into activity.

Buffalo—October shipments of iron are maintaining the good rate established in September. Bookings of local furnaces are the heaviest since the early summer of 1933. Deliveries are being taken at a rate indicating a general cleanup of contracts before their expiration.

Cincinnati—Despite more liberal attitude on the part of melters toward pig iron contracting for the fourth quarter, shipments so far this month fail to indicate any degree of piling against higher prices, all iron being moved to fulfill early needs which show moderate improvement over last month. Demand for southern iron is better, sales during the past week of about 1000 tons exceeding levels in recent years.

Birmingham, Ala.—Melters are placing spot orders more frequently. Five blast furnaces on foundry and two on basic will care for demands, with surplus stock, for an indefinite period. Strike in coal mining sections has not disturbed pig iron manufacture.

Toronto, Ont.—New pig iron business continues in good volume, with indications of further improvement as the year advances. Melters are contracting in larger tonnages and the daily melt gradually is nearing 50 per cent. No advance booking is being done, however.



Scrap

Scrap Prices, Page 67

Pittsburgh—The market has assumed an unusual front in this district in that many consuming mills have had their scrap requirements temporarily satisfied, yet there is no weakness in scrap secondary ranks, among original holders. This condition is unusual in view of absence of distress sales, probably because most brokers still have orders against which to ship. Depending upon shipping point in this district they are offering $13.25 to $13.50. At the same time, railroad scrap is commanding more than its usual premium when it is considered that the Pennsylvania railroad sold its heavy melting steel last week at $14.65, delivered in this district. Blast furnace borings and turnings have shown an advance of 50 cents and are now quoted $8.50 to $9.00 in view of purchases by a down-river mill, but machine shop turnings hold at $9.75 to $10.25.

Chicago—The scrap market here is drifting, consumers' prices being unchanged and mill buying quiet. Several more weeks will be required to complete shipments against orders and in the meantime steelworks are out of the market. Offerings continue plentiful, but distress accumulations are absent. Heavy melting steel is nominal at $12.25 to $12.75. Railroad heavy melting is bringing around $12.50, delivered.

New York—Substantial heavy melting steel shipments will move to the Buffalo district before the close of navigation at the end of this month. A good part of this scrap is coming from yards, and, despite reports of higher prices at Buffalo, $12 delivered, is being paid for

shipments from this district. Little scrap is moving to Eastern Pennsylvania from this section.

Boston — Scrap buying for export is less active, with prices easier, $9 to $9.25, dock, for No. 1 heavy melting steel and $8 to $8.25 for No. 2. Quotations for domestic shipment also follow the easier tendency.

Philadelphia—No. 2 heavy melting steel has been reduced to a flat price of $11, delivered consumers' plants. However, advances are noted in No. 1 cupola cast which is holding at $12 to $13 and in railroad malleable, now $13 to $13.50. The latter advance is attributed to buying in this district from the West.

Buffalo—Inquiry for the largest scrap tonnage of the year is expected between now and the end of the month. Mills are ready to buy but not at dealers' asking prices. With little or no new scrap moving into the district dealers seem to have the situation in hand. Largest holders of scrap here now demand $13.

Youngstown, O. — The lethargy that has characterized the iron and steel scrap trade in this district for several weeks still is in evidence, but not as yet to the detriment of quotations. Consumers buy only occasionally and then in small lots.

Detroit — The tone of the iron and steel scrap market continues heavy, with the possibility of some reductions in the next few days. The increase in offerings by automobile manufacturers is marked, as new models get into production. Meanwhile, demand from consumers is negligible. Dealers look for fair conditions over the remainder of the year, but not a bulge.

Cincinnati—Quotations on iron and steel scrap remain unchanged, as does the character of the market. Mills continue to resist tonnage commitments. Activity is confined to foundry purchases, dealer speculation and covering on old contracts.

Birmingham, Ala. — Continued firmness of iron and steel scrap indicates activity through the remainder of the year. Quotations are being maintained strongly.

Seattle — While export prices have not advanced, the market for steel scrap is firmer, due to war threats. Japan is beginning to show interest again and a few inquiries were received this week. The old iron steamer QUEEN has been dispatched from Seattle to Japan to be broken up, carrying 1100 tons of material shipped by Dulien Steel Products Inc., Seattle.

Toronto, Ont. — Shipments of iron and steel scrap are increasing. Sales, however, are largely confined to steel scrap, for the Hamilton district. Toronto and other Ontario consumers are entering the market and orders are better. Heavy melting steel has a steady call and there is some demand for turnings and other steel grades. Iron grades also are improving, but more slowly than steel. Prices are firm and unchanged.

St. Louis—Purchase of a round tonnage of heavy melting steel, reported at 4000 to 5000 tons, by an East side melter was reflected in advance in that grade. The purchase was for delivery over the next two months and was distributed among several local dealers.

Warehouse

Warehouse Prices, Page 68

Pittsburgh—A noticeable lull was evident in specifications for warehouse steel last week. However, this condition was not exactly consistent and some jobbers reported sustainment in their business for certain products. Changed quantity and size extras on cold-finished steel bars are now operative, as is the revised base price on hot-rolled bars.

Cleveland—After two months of little variation in the week-to-week volume of warehouse business, the trends now appears more definitely upward. The improvement is most noticeable in the heavier materials, especially shapes and bars, and in sheets and alloy steels. Shapes, long dormant, are in more active demand for manufacture of miscellaneous equipment. Prices are steady.

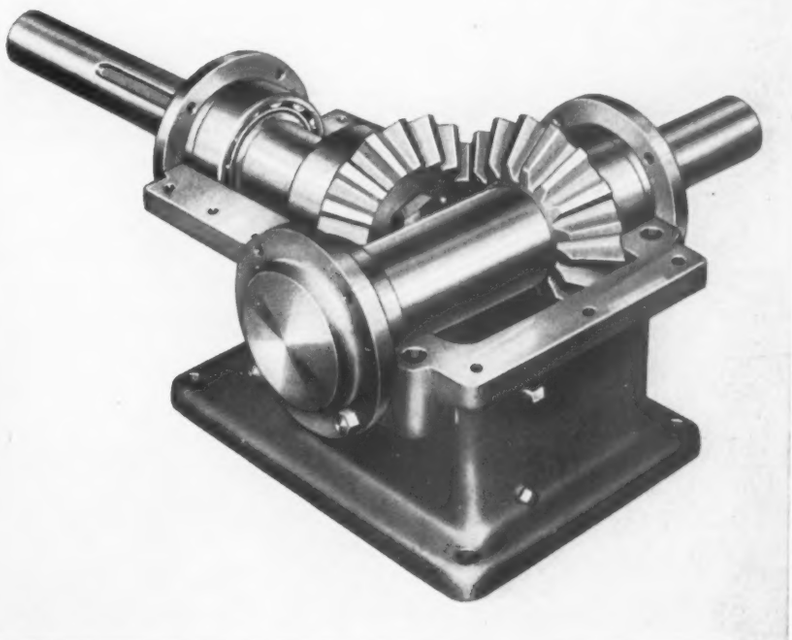
Chicago — Sales remain fairly steady, though little improvement was shown the past week. October, normally an active month, is expected to witness a further pickup over sales of previous months. Forging billets have been advanced $3 a ton to conform with the recent increase in mill prices.

Boston—One base price, 3.75c, now covers all cold-finished steel bar shapes out of warehouse. The 15.60c per 100 pounds analysis extra has also been eliminated on shipments of bessemer screw stock and regular shafting quality. On special grades, however, such as SAE 1020, 1120 and high manganese qualities, the regular mill extras will be added.

Philadelphia—Warehouse business is at least being sustained in most quarters, with some larger jobbers reporting better volume of business so far this month than in the corresponding period of September.

New York—Volume continues substantial, despite some anticipatory buying before the recent advance of hot-rolled carbon bars to 3.31c and bar shapes to 3.46c. Of the latter, high carbon SAE 1035 and 1045, rounds, have been listed at 3.51c.

GRANT SPEED REDUCERS



Another example of Grant's complete line of Reduction Units, Mitre and Bevel Gear Reducers. Three stock sizes, 1 to 22 h.p.

Your inquiries for any type of stock or special reducers or gears will receive prompt and cheerful attention.

GRANT GEAR WORKS, B St., South Boston, Mass.

Buying is well distributed. Sheet seconds, notably galvanized, continue to flood this district. With elimination of 15.00c spread on cold-finished, the new mill size extras are effective, also the usual extras for quality, finish, cutting and packing.

Baltimore—The market on hot rolled bars out of warehouse has been advanced $2 a ton to 3.05c, to conform with revisions in mill schedules. This is the only base price to have been revised recently. Demand is holding up well, with volume so far this month well ahead of the corresponding period last year.

Detroit—Warehouse business remains on a seasonally-high plateau. Since tool and die shops have not required as much material as usual for model changes in automobiles, this indicates a well-spread demand.

Cincinnati—Warehouse trade continues near levels of the past six weeks. Bars are now 3.22c, an advance of $1.

Metallurgical Coke

Coke Prices, Page 65

By-product coke producers are advancing prices about 50 cents a ton on foundry and domestic coke. The increase parallels that of a similar mark-up in beehive coke and both are attributable to the basis of settlement in the recent bituminous coal strike, which increases coke producers' costs. Since Oct. 1 the Connellsville, Pa., base on standard furnace coke has been quoted $3.55 minimum, with prices up to $3.70 reported on certain other transactions. Foundry coke is quoted $4.30, Connellsville, Pa., ovens for common grades, and $5.30 to $5.75 for premium grades.

Ferroalloys

Ferroalloy Prices, Page 66

New York—Following a lull, ferromanganese is moving more freely again, with producers looking for specifications this quarter to be the best this year. Meanwhile, prices are unchanged at $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is also unchanged in price, with lots up to 50 tons being quoted at $26, Palmerton, Pa., and larger quantities at $24.

Quicksilver

New York—Quicksilver prices are unchanged but strong with supplies limited. Small lots of 15 to 24 flasks are quotably $70.50 a flask, and 100-flask lots $69.50. Demand is light.

Coke By-Products

Coke By-Product Prices, Page 65

New York—Toluol and xylol shipments are confined largely to contract specifications, supplies for spot demand being light. The lacquer-making industry is buying heavily. Distillate prices are unchanged, but firm, especially benzol which has experienced an improved industrial and foreign demand. Naphthalene volume is limited to scattered small lots with contracting not expected to start until next month when prices for the next season will be announced. Phenol and sulphate of ammonia are unchanged.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Bolt and nut producers at Pittsburgh are gradually rounding up contracts covering fourth quarter at the revised discount of 75 off list. For the present, specifications are featureless although at a level equal to the first half of September. Large rivets hold at 2.90c, base, Pittsburgh or Cleveland, 3.00c, Chicago, and small rivets, 70-5 off list.

At Cleveland, releases from automobile manufacturers were the main factor in a moderate increase in orders. Jobbers' requirements improved slightly, but demand from railroads remained light. Efforts are being made to stabilize prices, some jobbers reported to be quoting less than customary prices.

Semifinished

Semifinished Prices, Page 65

Few specifications for forging quality billets have been placed since Oct. 1. In rerolling billets, where there has been no change in price or extras, specifications are fairly steady. Owing to the steady movement in galvanized and black sheets, which is sufficient to engage finishing mills on these products at about 70 per cent, demand for sheet bars is well sustained. Tin plate, however, is past its year peak. All Pittsburgh base prices on semifinished steel are unchanged.

Forging business in the Philadelphia district is unusually good, particularly in the larger forgings, both alloy and open hearth. Navy work is the most in evidence; although requirements for machine tools, axles and other products are the best in a considerable time. There is an especially good demand for bearing steels from manufacturing.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—Rate of operations in the tin plate producing industry has declined a few points to 45-50 per cent. Producers' stocks of finished tin plate are not moving to any great extent, and the presence of frost in certain tomato areas and elsewhere has been a discouraging development the past week. However, good prospects are reported for the Pacific coast salmon and the Hawaiian pine-

An experience of 33 years—a third of a century—backs Pittsburgh's finer

COLD DRAWN STEELS
ALL GRADES, SIZES AND SHAPES

DRILL RODS
CARBON...HIGH SPEED...ALLOY

SPECIAL SHAPES
SAVE MACHINING...METAL...MONEY

PITTSBURGH TOOL STEEL WIRE CO.
MONACA, PA.

apple packs. Standard tin plate holds at $5.25 per base box, with tin mill sizes of black sheets 2.75c, and No. 24 unassorted long ternes, 3.40c, Pittsburgh.

Steel in Europe

Foreign Steel Prices, Page 68

London—(*By Cable*)—Demand for steel and iron products in Great Britain is improving and delivery periods are being extended. The pig iron market is strong and contracts are being made for delivery in first quarter of 1936. Semifinished steel is active and some mills are working at full capacity. The market for structural and automobile steel is strong. Contracts have been booked for nine cargo vessels. Sales of galvanized sheets are fair, inquiries from Scandinavia increasing. Tin plate buying is active for domestic and export.

The Continent reports export trade moderate, with China buying some tonnage. France and Belgium have booked orders from Russia. It is reported some Russian pig iron has been sold to Swedish melters.

Nonferrous Metals

Nonferrous Metal Prices, Page 66

New York—Active demand and rising prices featured all major nonferrous metal markets last week. Strength in metals was attributed to war developments abroad accompanied by higher levels in London and to increased consumer buying here.

Copper—Prices rose $5 per ton late Monday to 9.25c, Connecticut, for electrolytic, the highest level attained since May 1, 1931. Sales in the domestic market averaged over 7000 tons daily for the first two weeks of October, an unusually high rate in view of heavy sales in recent months.

Lead—Business following the $2 advance Monday was not well distributed among sellers resulting in a cut of the same amount Thursday. The market closed unchanged from the previous week at 4.35c, East St. Louis, and 4.50c, New York, with St. Joseph Lead still obtaining $1 premium on certain of its brands on the Eastern market. The statistical position of the lead market is strong.

Zinc—Prime western advanced $2 per ton to 4.85c, East St. Louis, Tuesday. The higher level was supported by strong ore market, favorable statistical position and slightly improved demand.

Tin—Prices fluctuated widely, following London quotations and sterling exchange rates. Scarcity of supplies resulted in a stronger tone toward the end of the week and prices closed above the 53 cent level.

Antimony—Chinese spot advanced to 14.87½c, duty paid New York, chiefly on scarcity of supplies.

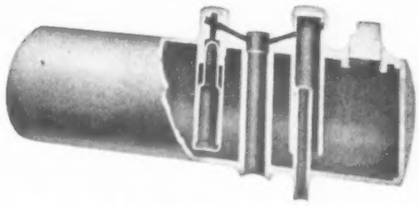
Equipment

New York—Machine tool buying is heavy, volume stimulated at the recent exposition moving upward, both orders and inquiry. Numerous industrial shops operating with old equipment since the depression are buying or taking figures on new machinery. There has been a pronounced improvement in the heavier types and automatic tools. Buying and inquiry by some of the larger plants in the East, including electrical equipment builders, locomotive shops and heavier capital goods producers is active. Inquiry for the navy department has also turned upward again.

Pittsburgh — Plans are gaining headway for American Sheet & Tin Plate Co., Pittsburgh, a subsidiary of United States Steel Corp., to build one of the largest strip mills in the world somewhere in the Pittsburgh district. Studies have been conducted for some time and among sites considered are Clairton, Pa., and the Edgar Thomson works. However, no definite request for appropriations has yet been made. The contract which United Engineering & Foundry Co. took from American Rolling Mill Co. (STEEL, Oct. 7, page 89) will be to supplement existing stands of a continuous hot mill train at Middletown, O., works of American Rolling Mill, which are themselves being widened to 80 inches. Among auxiliary equipment which United Engineering will supply is an automatic coil welding unit and flying shears of the precision type.

Boston — With substantial backlogs and an encouraging volume of business continuing to reach machine building shops, numerous plants have been forced to operate extra shifts and are pushed to make deliveries. A shortage of skilled mechanics, both in foundries and assembly shops, is becoming increasingly serious in some districts. Numerous orders are still developing as a result of the recent machine tool exposition with heavy inquiry which is also traceable to the event active. A large part of this buying is from private industry. Foreign volume has increased with some sellers and special machinery leads in demand.

CROSBY STAMPINGS



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Branch Offices
New York Chicago Philadelphia Detroit Cleveland

Construction and Enterprise

Michigan

CLARKSTON, MICH.—Alrey Steel Products Co., 66 South Main street, has been incorporated to engage in the processing of metals, by Reynold G. Nelson 430 West Huron street, Pontiac, Mich.

DETROIT—Shatterproof Glass Co., 161 South Waterman avenue, sustained severe damage by fire Oct. 7.

DETROIT—Link Engineering & Mfg. Co., 1056 Baltimore avenue, has been formed with $25,000 capital to engage in general manufacturing, by Herbert W. Link.

DETROIT—Detroit Metal Spray Co., 1 John R. Street, has been formed with $10,000 capital to deal in machinery, by Kegham Chutjian, 641 David Whitney building.

DETROIT — Evans Products Co., Union Guardian building, will add 30,000 square feet of floor space to its lumber products plant here. The addition will cost approximately $100,000 and will be equipped with a modern machine shop for production and precision work.

FLINT, MICH.—Kurt Kling, 632 Buhl building, Detroit, has purchased the Dailey Brewery here and will begin extensive alterations and improvements at once so that capacity of the plant can be increased from 150,000 to 250,000 barrels a year.

GRAND RAPIDS, MICH.—Charles Darling, city engineer, is preparing plans for alterations and improvements to the former power plant building of the Berkey & Gay Furniture Co.

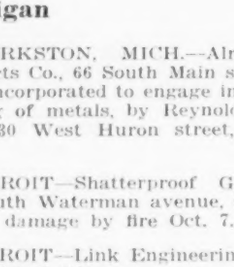
JACKSON, MICH.—State administrative board has completed plans for the following construction projects at the state prison here. A warehouse costing $66,000, alterations to the twine factory costing $10,000; alterations and improvements to the heating plant costing $10,000.

LANSING, MICH.—Lakeland Refinery Co., recently organized, will begin construction of an oil refining and distillate plant here sometime this month.

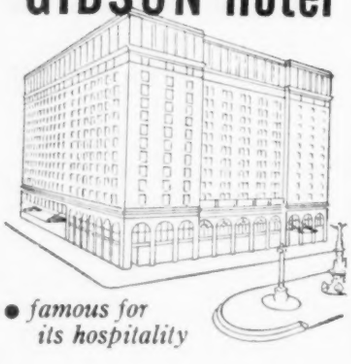
PONTIAC, MICH.—L. J. Heenan, Pontiac architect, is preparing plans for the construction of two additions to the plant of the Baldwin Rubber Co. One addition will be a single story structure, 102 x 142 feet, and the other will also be single story, 16 x 180 feet. Bids will be taken Oct. 15.

FAMOUS LANDMARKS

Jerusalem has the Mosque of Omar



Cincinnati has the GIBSON Hotel



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Rates—from $2.50 single; $4 double

F. W. PALLANT, General Manager

Ohio

CARDINGTON, O.—Municipality will take bids this month for waterworks system, costing $67,000. Jennings & Lawrence, 12 North Third street, Columbus, O., engineers.

CLEVELAND—Garfield Heights, a suburb, is considering erecting its own water plant. The Garfield Heights council put on first reading an ordinance contracting for water from a local company. The contract calls upon the Garfield Heights Water Co. to build a $139,000 local water plant. John A. Petsche is engineer.

EAST LIVERPOOL, O.—City officials have filed application for $1,500,000 PWA grant to build a municipally-owned electric power system.

LAKEWOOD, O.—City is considering construction of a $1,628,910 municipal water plant. John Fisher is engineer. Application has been filed with PWA.

LORAIN, O.—Brush Laboratories Co., 3715 Euclid avenue, Cleveland, has leased a plant here to carry on experimental work. Machinery is being moved from the Cleveland plant.

SPRINGFIELD, O. — International Harvester Co., 606 South Michigan avenue, Chicago, wil soon take bids for a 135 x 638-foot sheet metal plant, costing $600,000, and also a 1-story power plant building, costing $150,000. W. L. Dunn, care of the company, is engineer. (Noted July 29).

YOUNGSTOWN, O. — Municipality plans erecting water filtration plant, costing $40,000. J. Fruchtbaum, 154 West Huron street, Buffalo, engineer.

Illinois

BENSENVILLE, ILL. — Milwaukee railroad has started construction of a new machine shop at its roundhouse here.

CHICAGO—An explosion at the plant of the Glidden Soya Paint & Food Products Co., 2670 Elston avenue, subsidiary of the Glidden Co., Cleveland, caused considerable damage to the plant and machinery. Plans for rebuilding not decided.

CHICAGO—Midway Plating Works Inc., 3232 West Chicago avenue, has been incorporated by Tony Guarnieri, Edward O. Degrenier, and Richard Finaldi, to operate a general chemical and manufacturing business. Correspondent: Horatio Rocco, 77 West Washington street.

CHICAGO—Argus Engineering & Machine Co. Inc., 216 North Clinton street, has been incorporated to manufacture machinery of all kinds, by Harold G. Shevlin, Mildred Wilson and Mary R. Gaharty. Correspondent: Chaney & Chaney, 608 South Dearborn street.

CHICAGO—Felco Inc., 2355 Blue Island avenue, has been incorporated by E. Reuter, Robert W. Nessler, and Charles E. Felt, to manufacture machinery and appliances. Correspondent: Gann, Secord & Stead, 135 South LaSalle street.

Indiana

ANDERSON, IND.—Superior Ceramics Corp., L. S. Johns manager, 314 West Thirteenth street, plans constructing a plant, 40 x 80 feet, costing approximately $150,000.

HUNTINGTON, IND.—City council has authorized board of public works to apply to PWA for loans and grants to finance construction of a municipal electric light plant and distribution system, costing $1,045,500, and a city power plant, costing $152,140.

Rhode Island

EAST GREENWICH, R. I.—Boston Wire Stitcher Co. has two new plant additions under way, the second expansion within the past year. J. D. A. Whalen is president and treasurer.

New York

NEW YORK—Lamnin Machine Shop Inc. has been incorporated with $10,000 capital to operate a machine shop. Papers were filed by Albany Service Co., 315 Broadway, New York.

ROCHESTER, N. Y.—Will Corp. 845 Maple street, has plans nearing completion for erection of a factory addition, 120 x 131 feet. Cost will exceed $28,500.

ROCHESTER, N. Y.—F. A. Smith Mfg. Co., 185 Water street, North, maker of electrical equipment, will expend $25,000 in new installation and repair work, incidental to moving its plant to larger quarters on Augusta street.

SCHENECTADY, N. Y.—American Locomotive Co. will soon take bids for erection of a factory addition here. Cost estimated at $88,000.

New Jersey

CAMDEN, N. J.—Fire caused considerable damage to the general ware-

house of the New York Shipbuilding Corp. here.

Alabama

TARRANT, ALA.—City, Roy Ingram mayor, plans constructing a power distribution system. PWA loan and grant of $328,000 has been approved.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids Oct. 18, schedule 6094, one motor-driven geared head engine lathe, delivered Mare Island, Calif.; schedule 6136, one motor-driven milling machine; schedule 6137, motor-driven duplex milling machines; schedule 6144, one motor-driven metal cutting machine; schedule 6183, one motor-driven single cylinder wood surfacer, all delivered Norfolk, Va.; schedule 6115, one motor-driven cylindrical grinding machine; schedule 6185, one motor-driven plain type internal grinding machine, both delivered Philadelphia; Oct. 22, schedule 6196, electric motors and compensators, delivered White Plains, Md.; Oct. 29, schedule 6192, motor generator equipment, delivered Mare Island, Calif.

Kentucky

NEWPORT, KY.—With the purchase of a 34-acre site near here, H. H. Harris, Covington, Ky., reports that work will start at once on a $150,000 distillery for the Cave Springs Distilling Corp., St. Louis. The initial capacity will be 80 barrels daily.

RUSSELL, KY.—City council has authorized Mayor John Mullis to ask for PWA loan and grant of $50,000 for building a municipal electric plant.

SEBREE, KY.—City receives bids Oct. 18 for installing waterworks pumping equipment. Separate proposals will be taken, namely Div. A, pumping station buildings; Div. B, deep well turbine pumps; Div. C, chlorination equipment; Div. D, meter, piping, valves and electrical work.

Georgia

AMERICUS, GA. — Dayton Veneer & Lumber Mills, Dayton, Tenn., plans to establish a plant here for the manufacture of wooden containers for fruit and vegetables. W. E. Morgan is president.

ATLANTA, GA.—Steel Heddle Mfg. Co., 2100 West Allegheny avenue, Philadelphia, manufacturer of textile machinery, has acquired an interest in the Atlanta Reed & Harness Co. here, and will use the plant for experimental purposes for development of loom appliances.

ATHENS, GA. — City receives bids Oct. 10 for constructing filtration plant, with 3,000,000 gallons daily capacity. Centrifugal pumps will be installed. Estimated cost $135,000.

Mississippi

BILOXI, MISS.—City has submitted tentative plans for establishment of a municipal power plant. Application was made by A. G. Adler, Birmingham, Ala., for a loan totaling approximately $600,000.

Florida

FORT PIERCE, FLA.—City plans installing complete 2500 kilowatt unit and fuel oil tank of 50,000-barrel capacity, turbine, boilers, pump, smokestack, etc. PWA loan of $212,000 has been granted.

DELAND, FLA.—City, Grant Ely, city manager, has allocation of $444,000 for constructing power plant, distribution and street lighting systems.

MIAMI, FLA.—City, William Sydow, public service director, has allotment approved of $70,910 for additions and alterations to incinerator plant. Project includes replacement of boiler, steam turbine and pump, repairs to furnaces and superstructure.

Tennessee

COPPERHILL, TENN. — Tennessee Copper Co.'s foundry recently sustained damages by fire.

WEST MEMPHIS, TENN.—City, W. M. Hundhausne mayor, has allotment of $62,500 for constructing sewer system. Work will start in about 30 days.

West Virginia

CLARKSBURG, W. VA.—Pittsburgh Plate Glass Co., Grant building, Pittsburgh, will build a plant here.

Missouri

CUBA, MO.—City, C. B. Belden, mayor, has loan and grant of $34,000 for constructing sewage disposal plant.

FORNFELDT, MO.—City plans expending $48,000 for waterworks system, including pumping plant and elevated tank. John J. Miller, engineer, Ilmo, Mo.

MONETT, MO. — Application has again been made to PWA headquarters at St. Louis for a grant of $65,342 to be used for installing a diesel engine generating unit and constructing a municipal light and power plant, a prior application failing to get approval.

NEVADA, MO.—City has grant of $112,000 for extension of sewage system and constructing disposal plant.

OVERLAND, MO.—Overland sewer district of St. Louis county, M. J. Mohan, president, 2512 Marion avenue, has grant of $145,000 for sewage disposal plant. Total cost estimated at $300,000.

THAYER, MO.—Plans have been prepared for a municipal light and power plant to cost $72,750. Mayor C. A. Reef has filed an application for a PWA grant of $32,737 and loan of $40,012 to finance the project.

Texas

HOUSTON, TEX.—Earl M. Jorgensen Steel Co., Los Angeles, contemplates erecting a plant on Clinton drive, costing $50,000. W. A. Brunet, Shell building, Houston, contractor.

HOUSTON, TEX.—Stenzel Pattern Works, 2300 Nance street, will erect a factory, 60 x 75 feet, at Navigation and Hutchinson streets. Air conditioning equipment will be installed.

KAUFMAN, TEX.—Building and machinery of the Kaufman Compress were severely damaged by fire recently.

NOCONA, TEX.—H. H. Powell, Fort Worth, Tex., and Henry McGrew, Nocona, Tex., have acquired entire equipment of foundry and die manufacturing plant of Southwestern Tool Co., Fort Worth, which they will move to Nocona.

ROCKWALL, TEX.—Application has been made to PWA for allocation of a $50,000 loan and grant for erecting a municipal light plant.

SEADRIFT, TEX.—City, R. L. Maxwell, mayor, receives bids Oct. 31 for waterworks system, including pumping equipment, pumping station, two elevated steel tanks and towers, etc.

Wisconsin

MANITOWOC, WIS.—City utilities commission will call for bids soon for enlarging municipal power plant, at cost of $141,000. PWA grant has been approved. A. H. Zander is city clerk.

MILWAUKEE—Heil Co., 3000 West

(*Please turn to page* 87)

Special Carbon and Alloy Spring Wire

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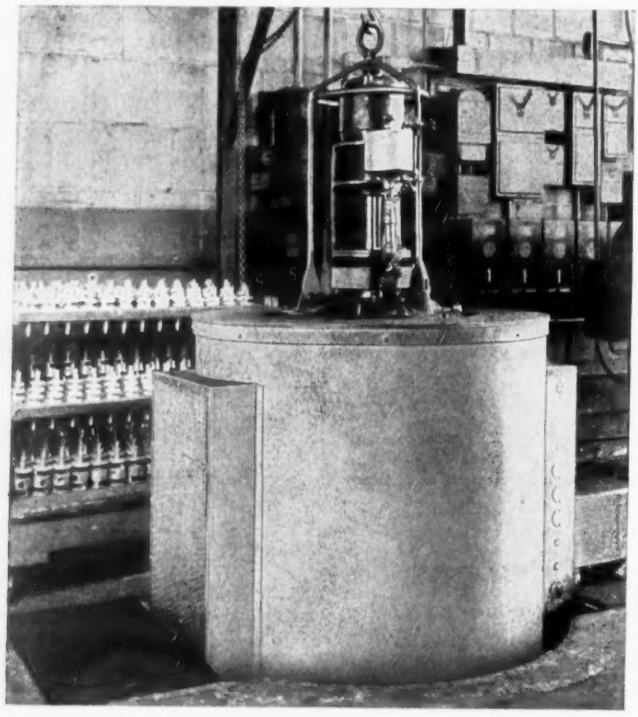

Hevi-Duty Vertical Furnace in the plant of Johnson Motor Company, Waukegan, Illinois.

Send for Bulletin No. 931, it describes the Electric Vertical Retort Carburizer.

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Penton's Foundry List

The first since 1930 and the only available complete and accurate list of all foundries in the United States and Canada.

Approximately 5500 foundries are listed. The name and address of each foundry is given and the kind of metal melted indicated. The method of melting, whether crucible, electric furnace, open-hearth; number of melting units and capacity also will be shown in the majority of cases. Machine shop and pattern shop departments also are indicated.

The list includes—

3,580—Gray Iron
343—Steel (of which 229 are electric)
159—Malleable
2,860—Nonferrous (of which 1,356 are exclusive nonferrous foundries and 1,504 nonferrous departments of other foundries)
86—Permanent Mold
92—Die Casting
3,356—Pattern Shops
3,388—Machine Shops

The new List is bound loose leaf, page size 6 x 9, printed in typewriter type for easy reference and convenience in addressing envelopes, filling in letters or drawing off special lists, with listings arranged geographically by towns and states. Price $50 delivered.

The Penton Publishing Co.
Book Department
1207-35 W. Third St.,
Cleveland, Ohio

(Concluded from Page 85)

Montana street, is considering establishing a plant in the East for the manufacture of oil tank equipment.

MILWAUKEE—Bids will be asked shortly for building and equipping a new boiler plant at the Milwaukee county home for dependent children, costing $90,000.

MILWAUKEE — Everbrite Electric Signs Inc., 1434 North Fourth street, will build a 3-story addition, 50 x 80 feet, for manufacturing neon signs. C. J. Wamser is president.

NEENAH, WIS.—Neenah Foundry Co. is building an addition to its shop and adding a new sand house.

RACINE, WIS.—Architect Frank J. Hoffman, Janes building, is completing plans for a third unit of the Racine vocational school, estimated to cost $200,000. T. S. Rees is school principal.

WEST ALLIS, WIS.—Sterling Wheelbarrow Co. is completing plant modernization work costing about $30,000, principally for the purpose of introducing a new line of foundry equipment. The concern is increasing the line of steel foundry flasks to include units of larger capacity.

Minnesota

ST. PAUL—King Road Equipment Co., 2694 University avenue, has been organized and incorporated by Thomas Gallagher, M. E. Helges, and Paul T. Semple, to handle road machinery and equipment.

ST. PAUL—Donaldson Co. Inc., manufacturer of sheet metal specialties, 666 Pelham street, Frank A. Donaldson president, will soon award contracts for construction of a 2-story addition to factory, to cost about $35,000.

ST. PAUL—Superior Metal Products Co., manufacturer of milk cans, milk strainers and other equipment, has awarded contract for alterations and remodeling to factory and will also include installation of additional machinery and equipment.

South Dakota

ABERDEEN, S. DAK.—H. V. Johnston Culvert Co., Minneapolis, has opened a branch plant here for the manufacture of corrugated metal culverts.

YANKTON, S. DAK.—City plans construction of a municipal light and power plant, to cost about $600,000. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, engineer.

Iowa

GREENFIELD, IOWA—Town council will take bids Oct. 28 for construction of a municipal waterworks system, to cost about $75,000, including cast iron pipe mains, pump house, purification plant, etc. Lafe Higgins Jr., Hubbell building, Des Moines, Iowa, engineer.

PERRY, IOWA—City council will take bids Oct. 21 for a diesel generating unit for the city water plant. Donald Kanealy is city clerk.

SUMNER, IOWA—Overton Chemical Co. has begun construction of a 1-story factory, 42 x 132 feet.

Montana

ANACONDA, MONT. — Anaconda Brewing Co., A. J. Tuchscherer president, plans construction of a new bottling plant and making various improvements to brewing plant.

BUTTE, MONT.—Montana Iron Works, 920 South Arizona street, structural steel fabricators, founders and machinists, has been granted a building permit for alterations and remodeling to its plant.

GREAT FALLS, MONT.—City plans erection of a 1,000,000-gallon capacity elevated steel water tank in Boston Heights addition, to cost $70,000. Arthur J. Cook is city engineer.

GREAT FALLS, MONT.—Great Falls Breweries Inc., E. G. Sick president, plans an addition to its malting plant to provide facilities for 100,000 bushels of additional malting capacity. Additional drums will be installed. Paul W. Kuschel is manager.

GREAT FALLS, MONT.—Volk's Brewery, Charles E. Volk proprietor, plans construction of a bottling plant and also an addition to the storage cellar, to provide 3000 barrels additional storage capacity. Complete new bottling equipment wil be installed.

GREAT FALLS, MONT.—Great Falls Coach Lines Co., Ed Klies president, has plans for remodeling bus terminal and for construction of a 1-story addition, 50 x 150 feet, to cost $40,000. Entire building when completed will be 150 x 150 feet, and will include complete machine shop.

KALISPELL, MONT.—Don J. and Walter Baize have started construction of a 10,000-gallon oil refinery southeast of here. Work on a cracking unit will be started about Jan. 1.

NEIHART, MONT.—Montana Silver Queen Mining Co., Charles Wethered president, has started work on a mine mill at the Big Seven mine property, to cost about $75,000.

NEIHART, MONT.—The mining property of the old Florence Mining & Milling Co. has been leased by J. R. Neidig, A. G. Reider, John Pamenter and L. B. Stark, who plan construction of an ore mill to handle ores from property.

Utah

BINGHAM CANYON, UTAH—Utah Copper Co. is contemplating increasing its production both at the mines and mill.

SALT LAKE CITY, UTAH—American Foundry & Machine Co., 870 South Fourth West street, plans construction of a new pattern shop and warehouse. Improvements are being made in anticipation of increased business. P. A. Mattingly is general manager.

Pacific Coast

RICHMOND, CALIF. — A modern steam power plant and other improvements to the refinery plant of the Standard Oil Co. of California here, are to be built under a contract awarded to Stone & Webster Engineering Corp., at a cost of $1,800,000. Work will be started at the end of this month.

SEATTLE—Lake Union Dry Dock & Machine Works is planning to construct a warehouse.

Ryerson Completes Large Addition to Its Jersey City Warehouse

JOSEPH T. RYERSON & SON INC., Chicago, recently completed a new extensive addition to its Jersey City, N. J., plant, making available an additional 45,000 square feet of floor space for the stocking of steel and allied lines.

The new warehouse, a two-story brick building, is heated throughout and has the latest equipment for the storing and handling of the finer steel products. Special racks keep the material in good condition, and permit quick and easy selection of any grade or size. The heating system holds the temperature at a uniform degree, preventing any condensation of moisture or sudden change that would affect the quality and finish of special steels carried in stock.

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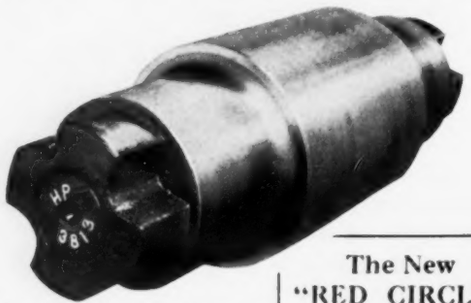

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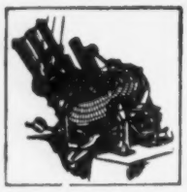

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